Spring Flood Outlook for Iowa Update

National Weather Service

Des Moines, IA

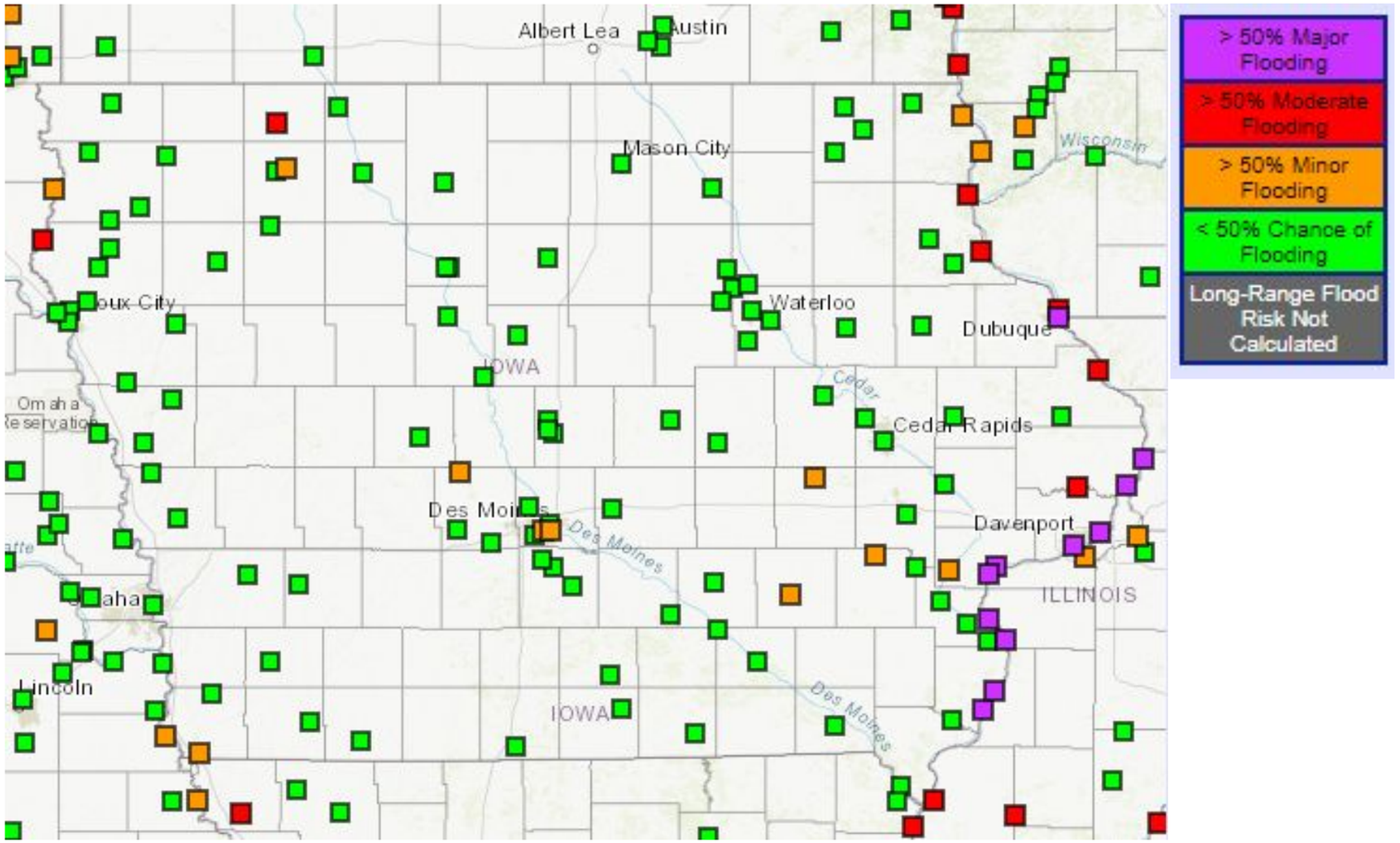
March 24, 2023

Spring 2023 Flood Outlook for Iowa

Overview

Key Messages

- **Much above normal spring flood threat for the Mississippi River. Flooding along the Mississippi River has the potential to be similar to what happened in 2019.**
- Near to below normal spring flood threat for the rest of the state–except for the Big Sioux River, where the risk is above normal.
- Future weather–especially the weather conditions leading up to, during and immediately after the snowmelt period–can be a big factor in any spring flood threat.
- Points highlighted in orange have a >50% chance of reaching minor flood stage.
- Points highlighted in red have a >50% chance of reaching moderate flood stage.
- Points highlighted in purple have a >50% chance of reaching major flood stage.



Flood risk from late March through mid June

Click here for the latest map

Spring 2023 Flood Outlook for Iowa

Flood risk by river, 3/23/2023

Below is the spring flood risk for the rivers in and bordering Iowa. Where the risk on a given river changes above or below a certain point, the river is broken into segments.

River	Spring Flood Risk
Mississippi River–down to Davenport	**Much above normal**
Mississippi River–downstream of Davenport	**Much above normal**
Big Sioux River (far northwest Iowa)	Above normal
Missouri River–down to Platte River	Near to below normal
Missouri River–downstream of Platte River	Near normal
Tributaries to Mississippi River in Eastern Iowa	Near to below normal
Tributaries to Mississippi River in Central Iowa	Near to below normal
Tributaries to Big Sioux River	Near normal
Tributaries to Missouri River in Iowa	Near to below normal

Spring 2023 Flood Outlook for Iowa

Spring flood element checklist, 3/23/2023

Below is the spring flood element checklist including the impact of current conditions on potential spring flooding. The individual elements appear on the following slides. Flooding from ice jams is a minimal risk this year, but there may be some localized issues mainly across the far north.

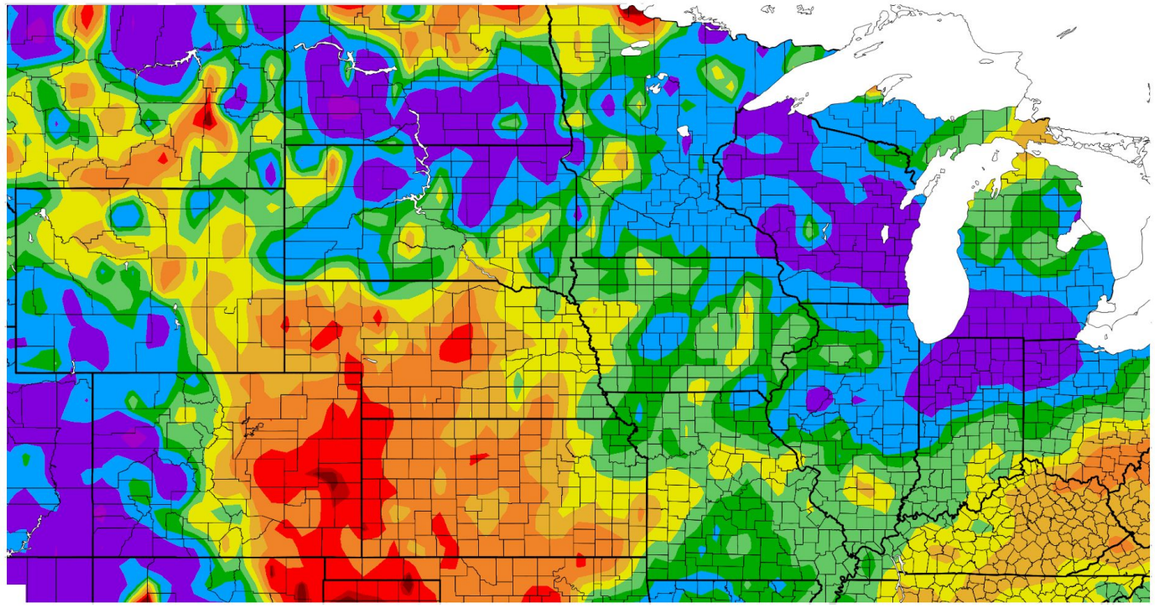
Element	Impact on Potential Spring Flooding	Link to Latest Information
River levels	Neutral	USGS WaterWatch
Soil moisture	Increased risk (northeast and south central), decreased risk (west), neutral elsewhere	NWS/CPC Soil Moisture
Snowpack/snow water equivalent	Increased risk for the Mississippi River and upper portions of the Des Moines River basin, neutral elsewhere	NWS/NOHRSC Snow Water Equivalent
Frost depth	Neutral	NWS Frost Depth
Monthly temperature outlook	Neutral	NWS/CPC Outlooks
Monthly precipitation outlook	Neutral to increased risk (especially for Mississippi River)	NWS/CPC Outlooks

For your reference, here are links to the current Drought Monitor as well as the NWS/CPC Seasonal Drought Outlook.

Spring 2023 Flood Outlook for Iowa

Percent of normal precipitation and departure from normal temperature, last 30 days

Percent of Normal Precipitation (%)
2/22/2023 – 3/23/2023

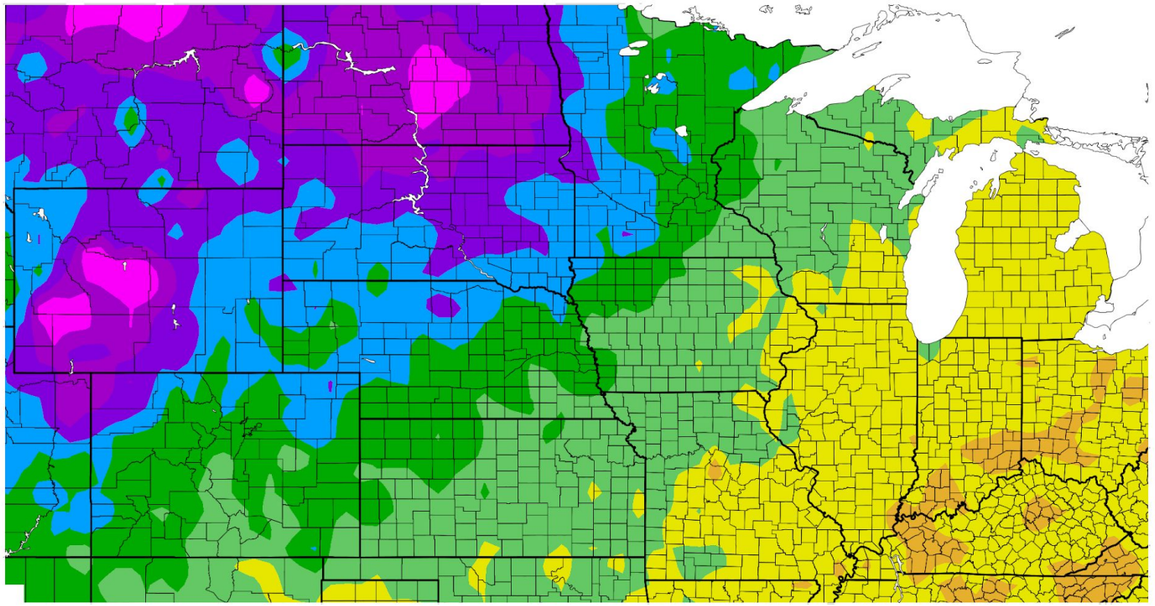


2 5 25 50 75 100 125 150 200 400 800

Generated 3/24/2023 at HPRCC using provisional data. NOAA Regional Climate Centers

Above and below normal across Iowa

Departure from Normal Temperature (F)
2/22/2023 – 3/23/2023



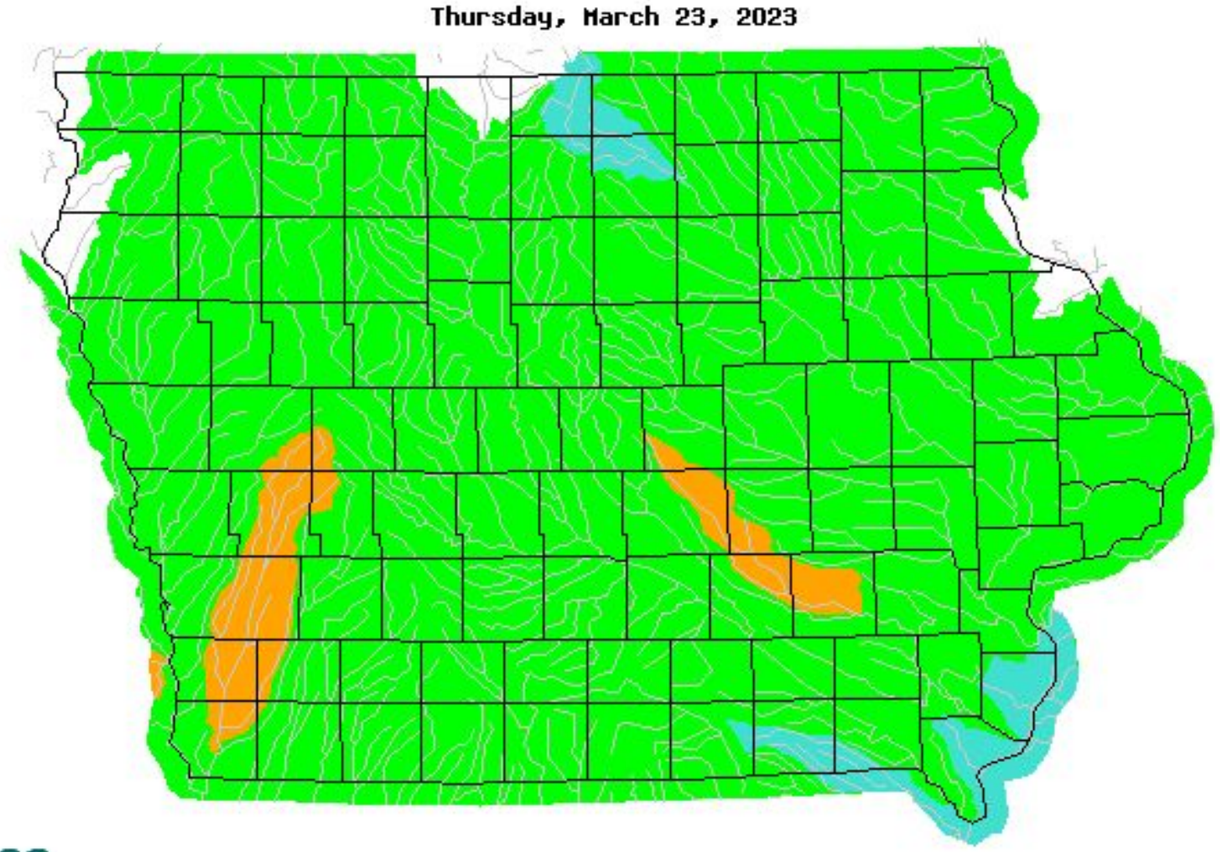
−15 −12 −9 −6 −3 0 3 6 9 12 15

Generated 3/24/2023 at HPRCC using provisional data. NOAA Regional Climate Centers

Above normal across eastern third of Iowa, below normal elsewhere

Spring 2023 Flood Outlook for Iowa

River level percentiles



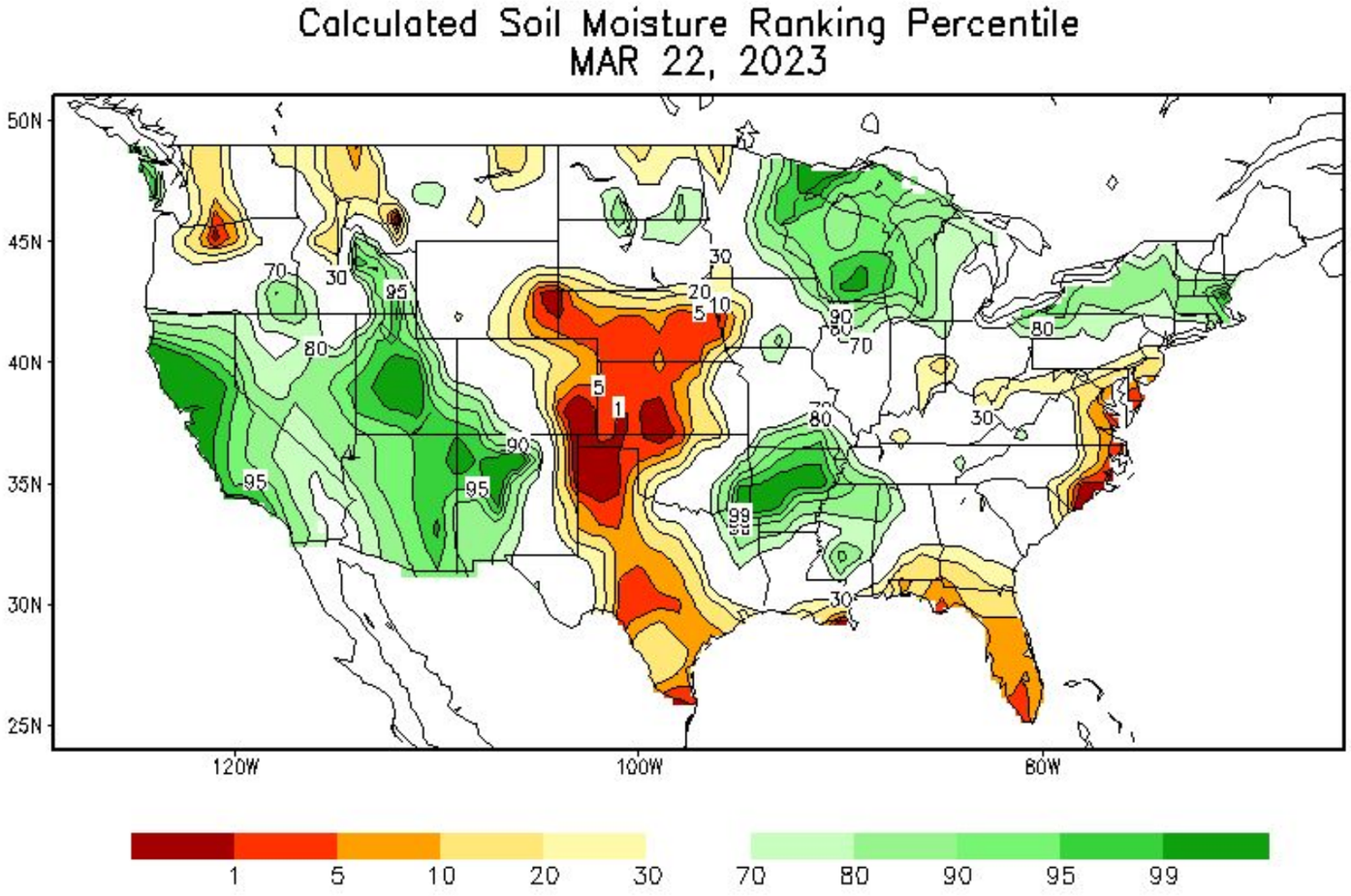
USGS

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Generally near normal stream flows across Iowa

Spring 2023 Flood Outlook for Iowa

Soil moisture percentiles



30th to 70th percentile is near normal (white)

>70th percentile is above normal (green)

<30th percentile is below normal (brown/red)

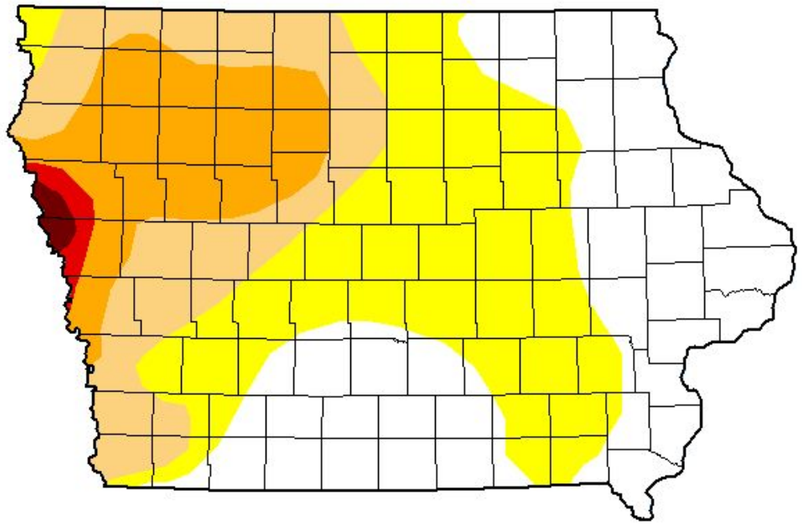
Above normal across northeastern and south central Iowa, below normal across the west and near normal elsewhere

Spring 2023 Flood Outlook for Iowa

Drought Monitor and Drought Monitor class change, 1 year

U.S. Drought Monitor

Iowa



March 21, 2023

(Released Thursday, Mar. 23, 2023)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	35.33	64.67	31.93	15.54	1.51	0.57
Last Week *03-14-2023*	35.33	64.67	31.93	15.54	1.51	0.57
3 Months Ago *12-20-2022*	9.52	90.48	66.66	29.43	8.83	0.57
Start of Calendar Year *01-03-2023*	10.69	89.31	66.66	29.43	8.83	0.57
Start of Water Year *09-27-2022*	20.90	79.10	45.05	22.25	5.07	0.02
One Year Ago *03-22-2022*	22.12	77.88	36.58	2.30	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

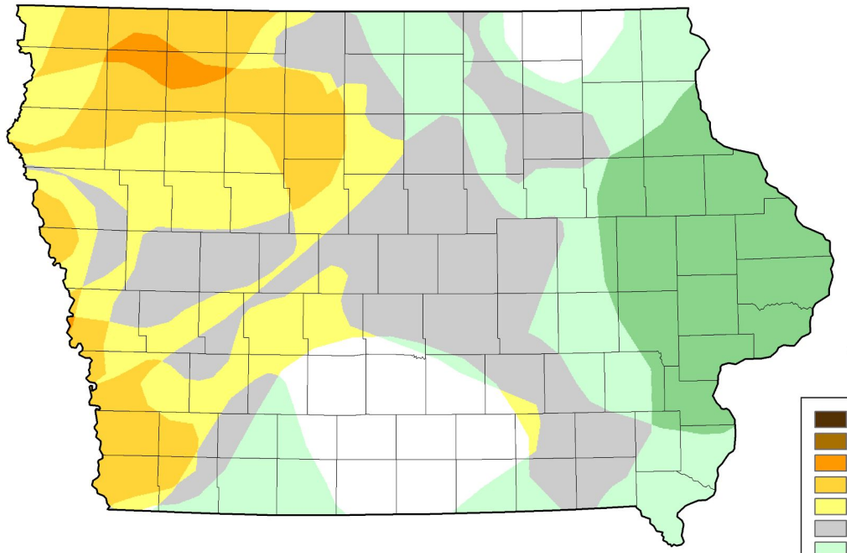
Curtis Riganti

National Drought Mitigation Center

droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - Iowa

52 Week



March 21, 2023 compared to March 22, 2022

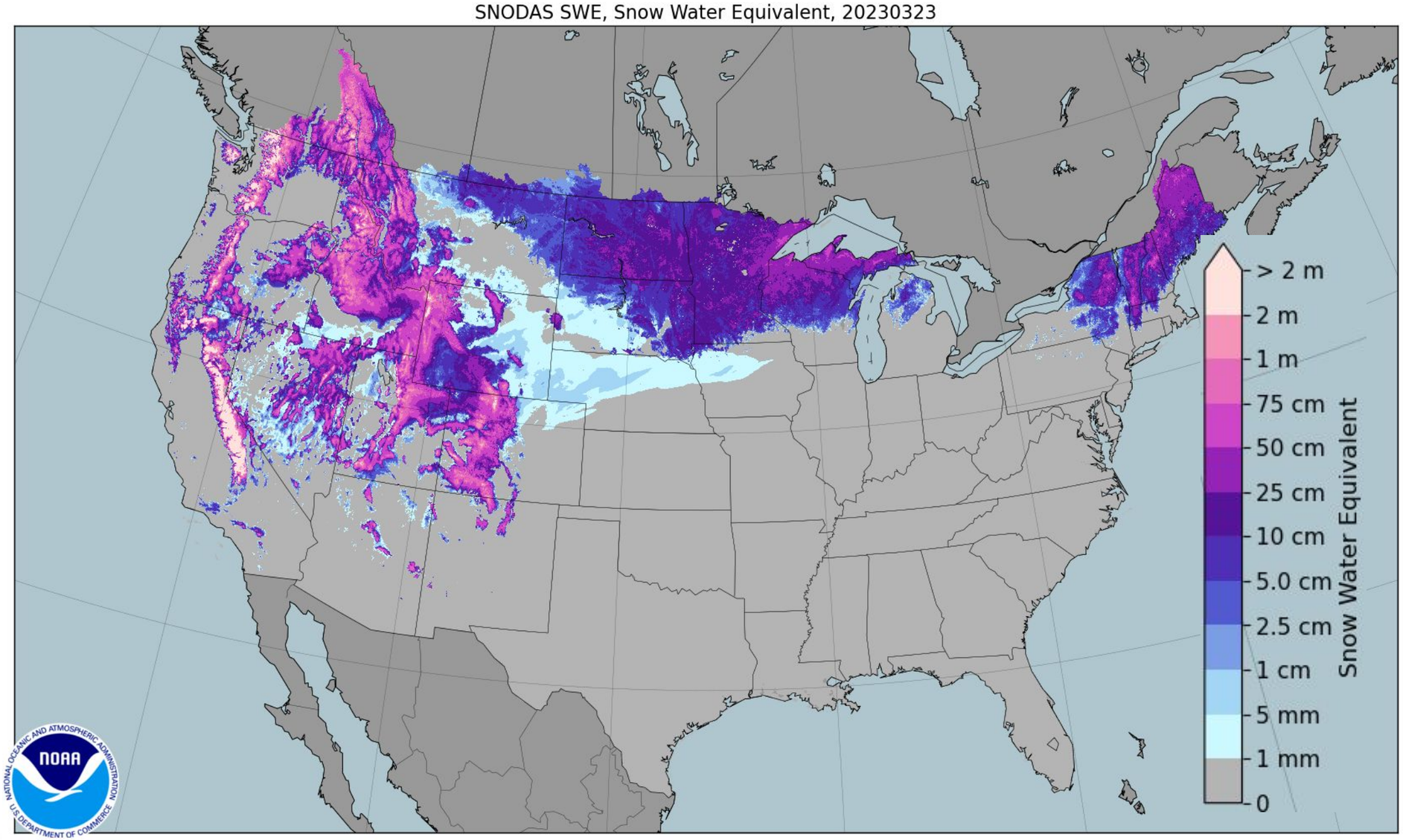
droughtmonitor.unl.edu

- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

Drought Monitor improvement across portions of eastern and southern Iowa over the past year; worsening to no change elsewhere

Spring 2023 Flood Outlook for Iowa

Snow water equivalent, 3/23/2023

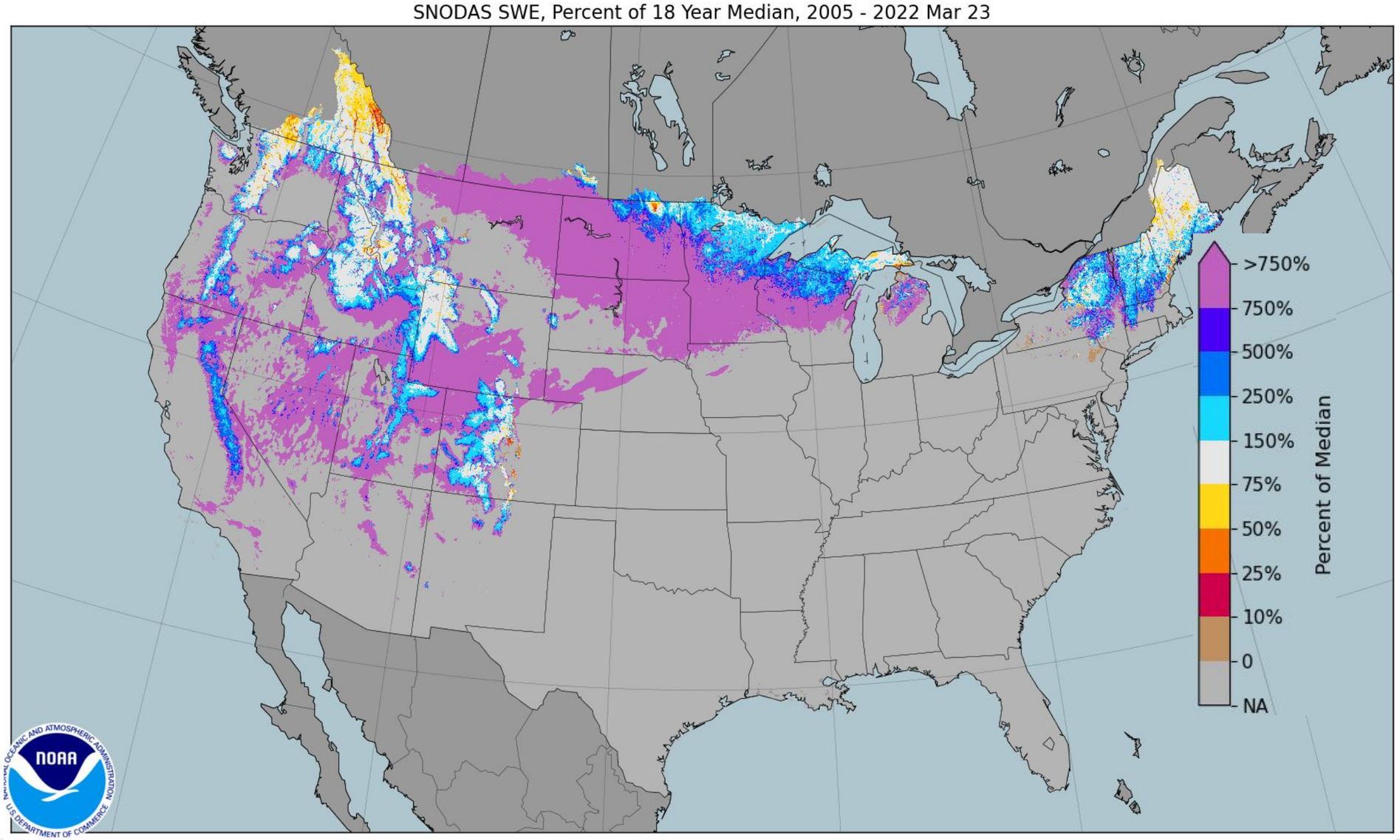


To convert centimeters (cm) to inches: approximately 2.5 cm equals one inch

High snow water equivalent values from South Dakota into Wisconsin including far northern Iowa

Spring 2023 Flood Outlook for Iowa

Snow water equivalent percent of normal, 3/23/2023



Very high snow water equivalent compared to normal (median) from South Dakota into Wisconsin including far northern Iowa; near to below normal elsewhere

Spring 2023 Flood Outlook for Iowa

Frost depth, 3/23/2023

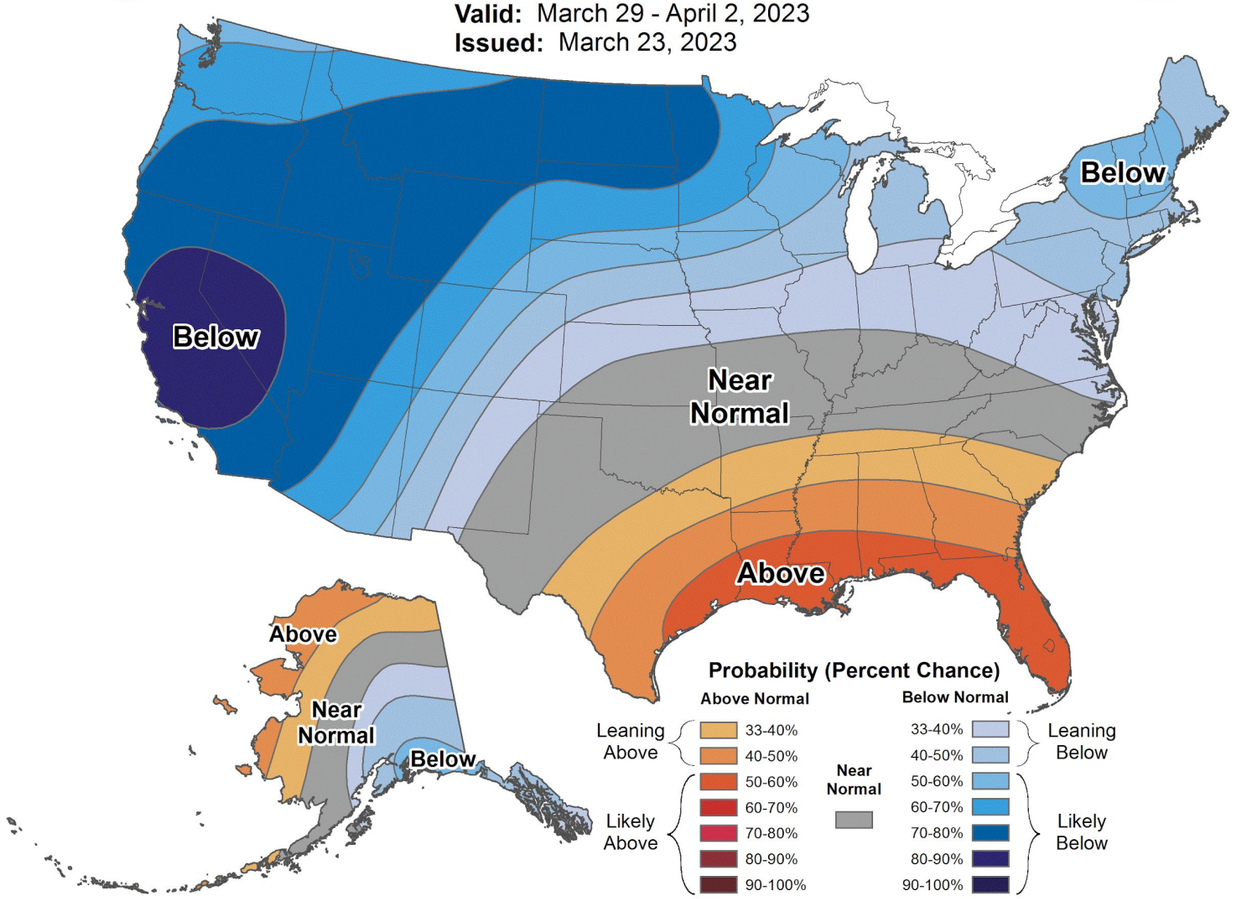
Little to no frost depth across the southern half of Iowa

Spring 2023 Flood Outlook for Iowa

6-10 day temperature and precipitation outlooks

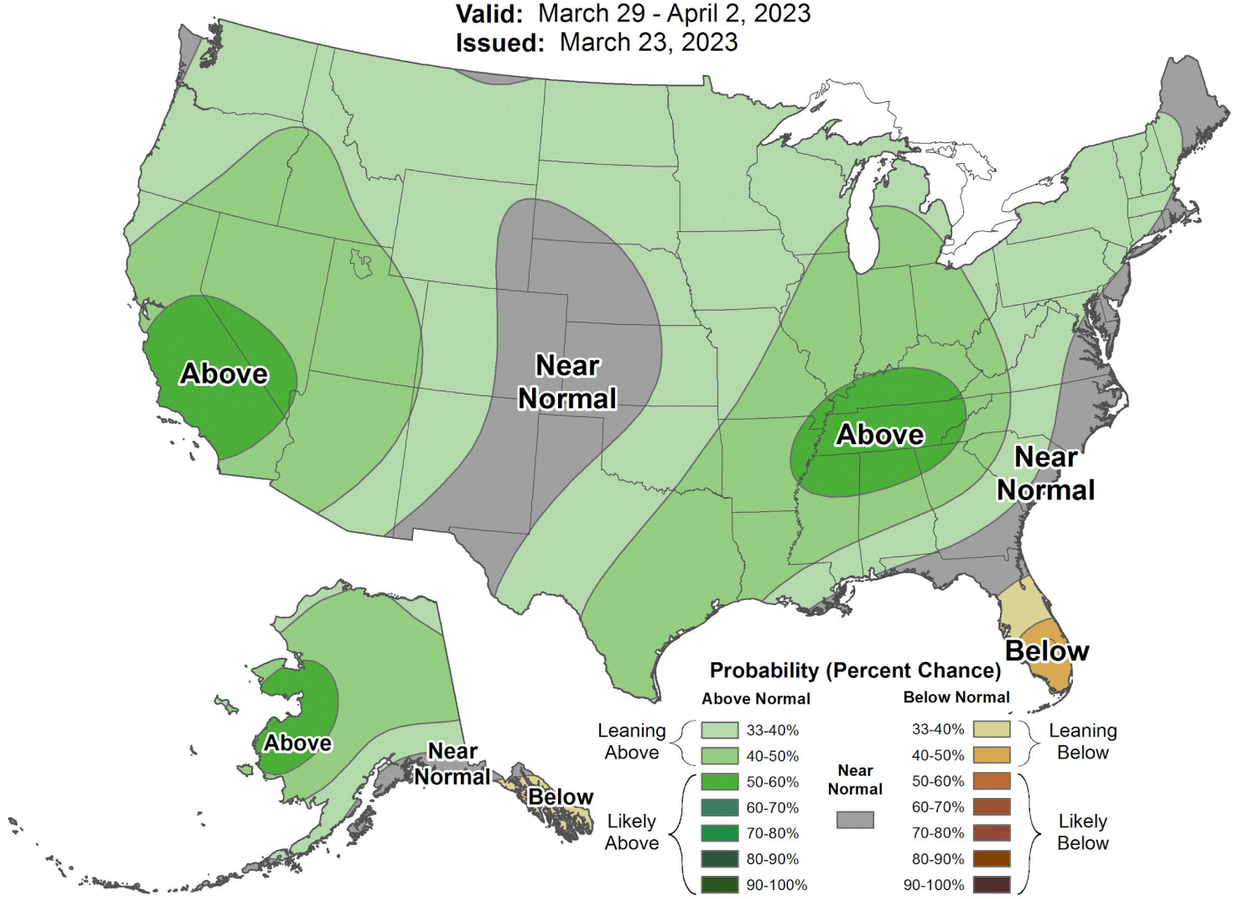
6-10 Day Temperature Outlook

Valid: March 29 - April 2, 2023
Issued: March 23, 2023



6-10 Day Precipitation Outlook

Valid: March 29 - April 2, 2023
Issued: March 23, 2023



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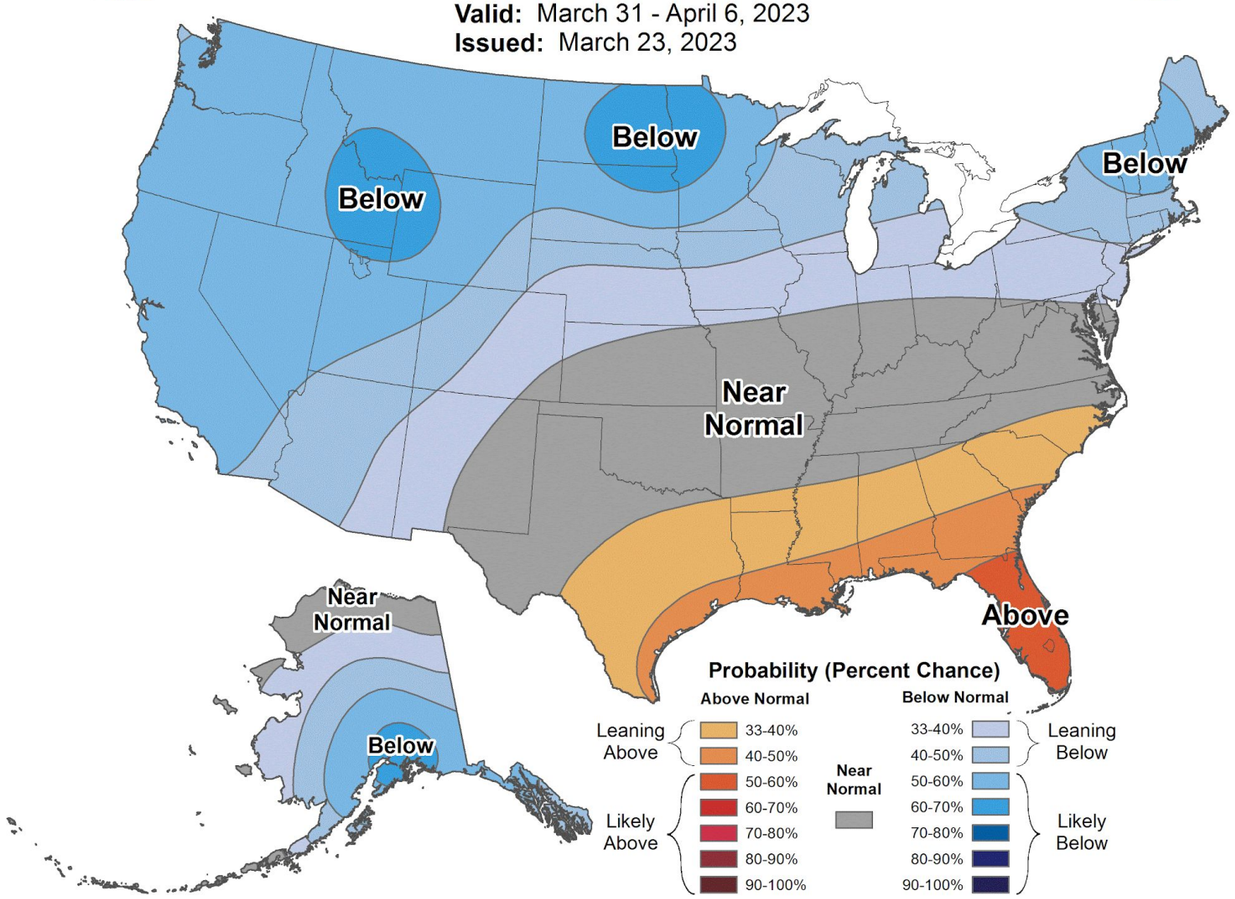
Spring 2023 Flood Outlook for Iowa

8-14 day temperature and precipitation outlooks

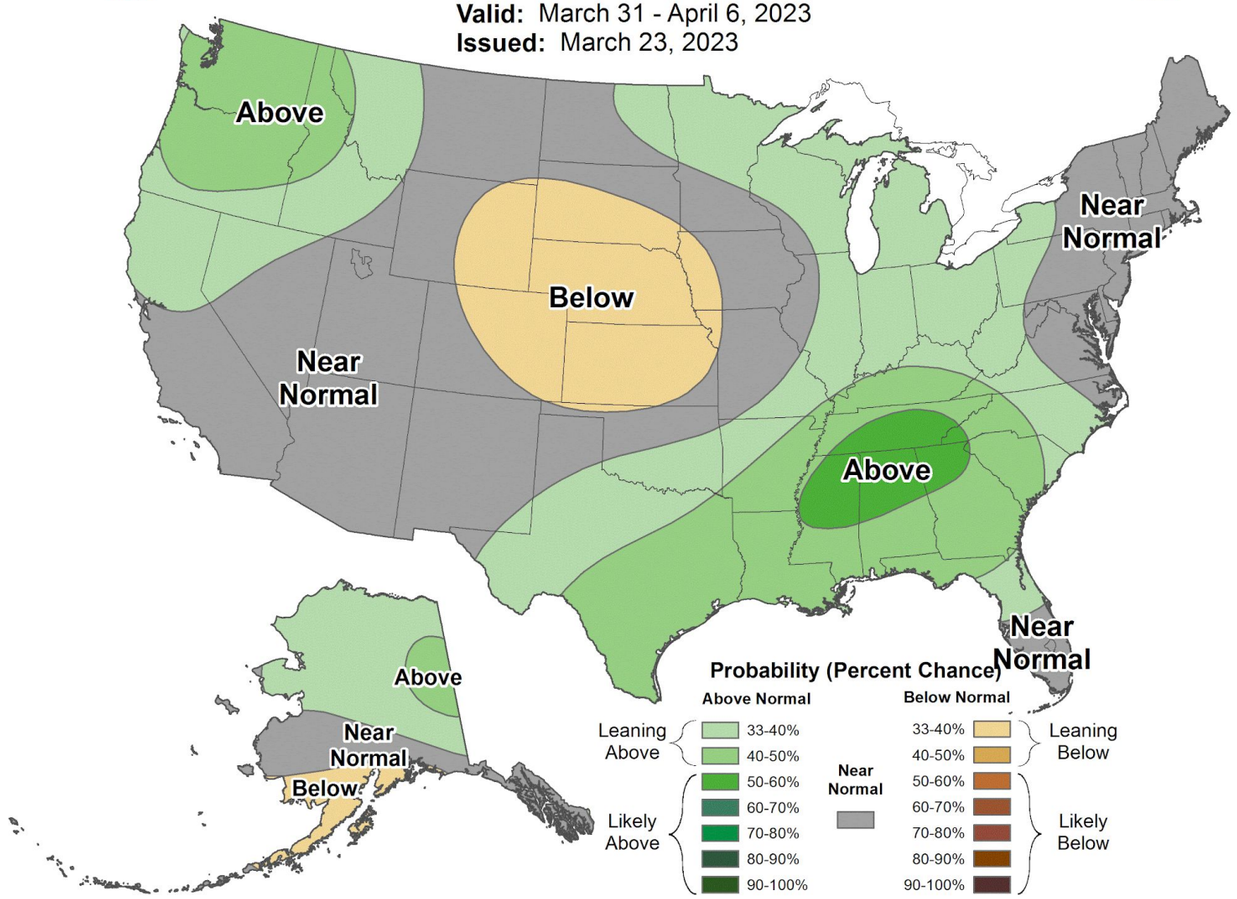
8-14 Day Temperature Outlook

Valid: March 31 - April 6, 2023
Issued: March 23, 2023



8-14 Day Precipitation Outlook

Valid: March 31 - April 6, 2023
Issued: March 23, 2023



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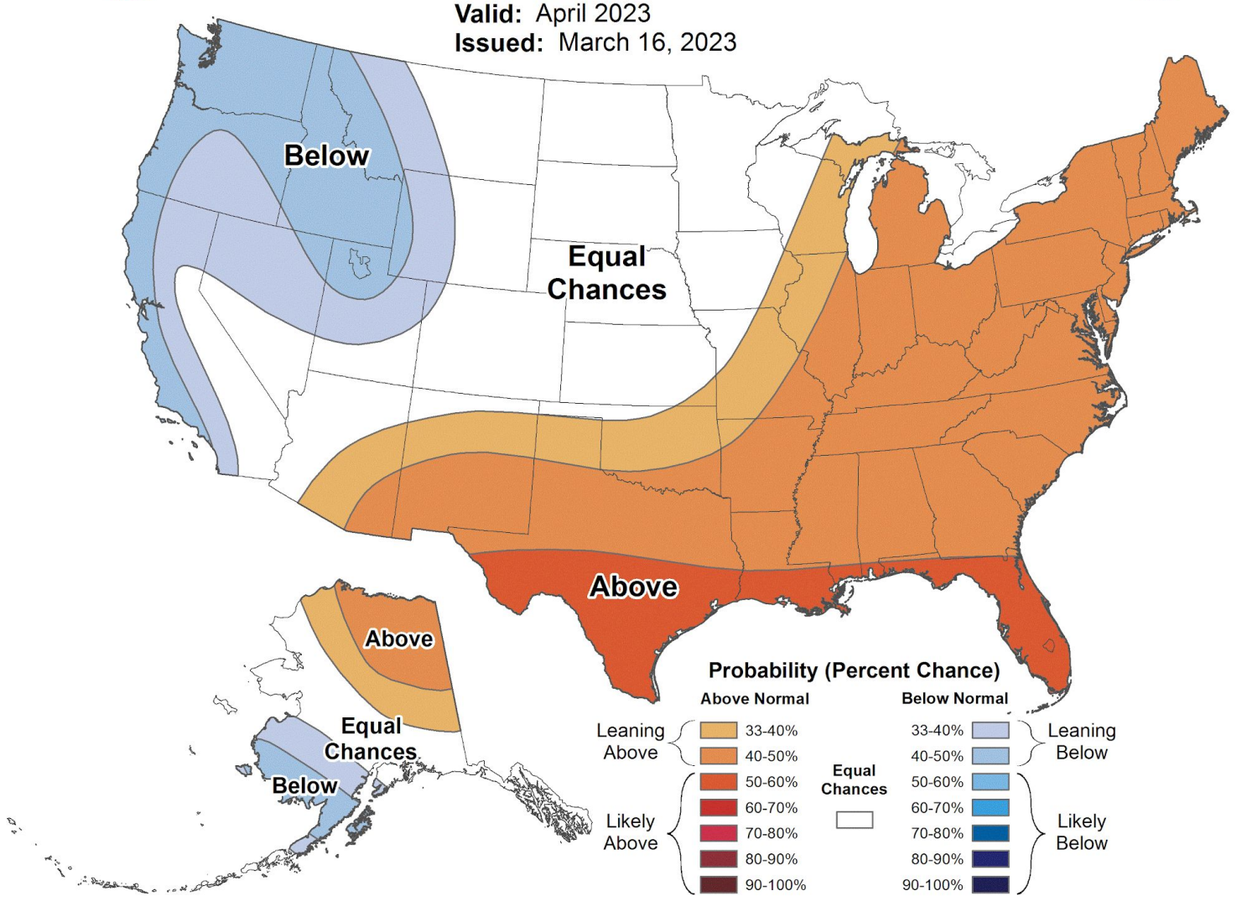
Spring 2023 Flood Outlook for Iowa

Monthly temperature and precipitation outlooks

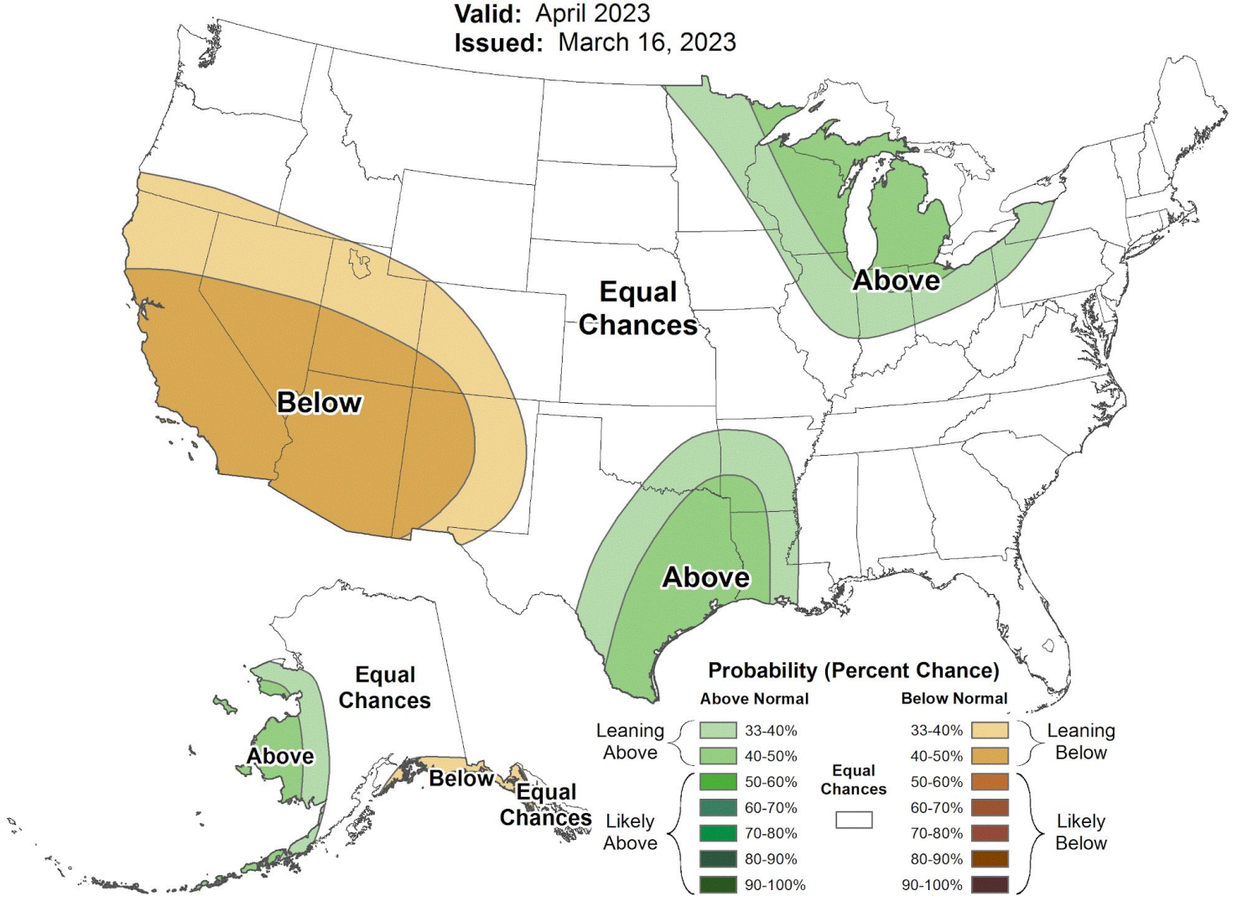
Monthly Temperature Outlook

Valid: April 2023
Issued: March 16, 2023



Monthly Precipitation Outlook

Valid: April 2023
Issued: March 16, 2023

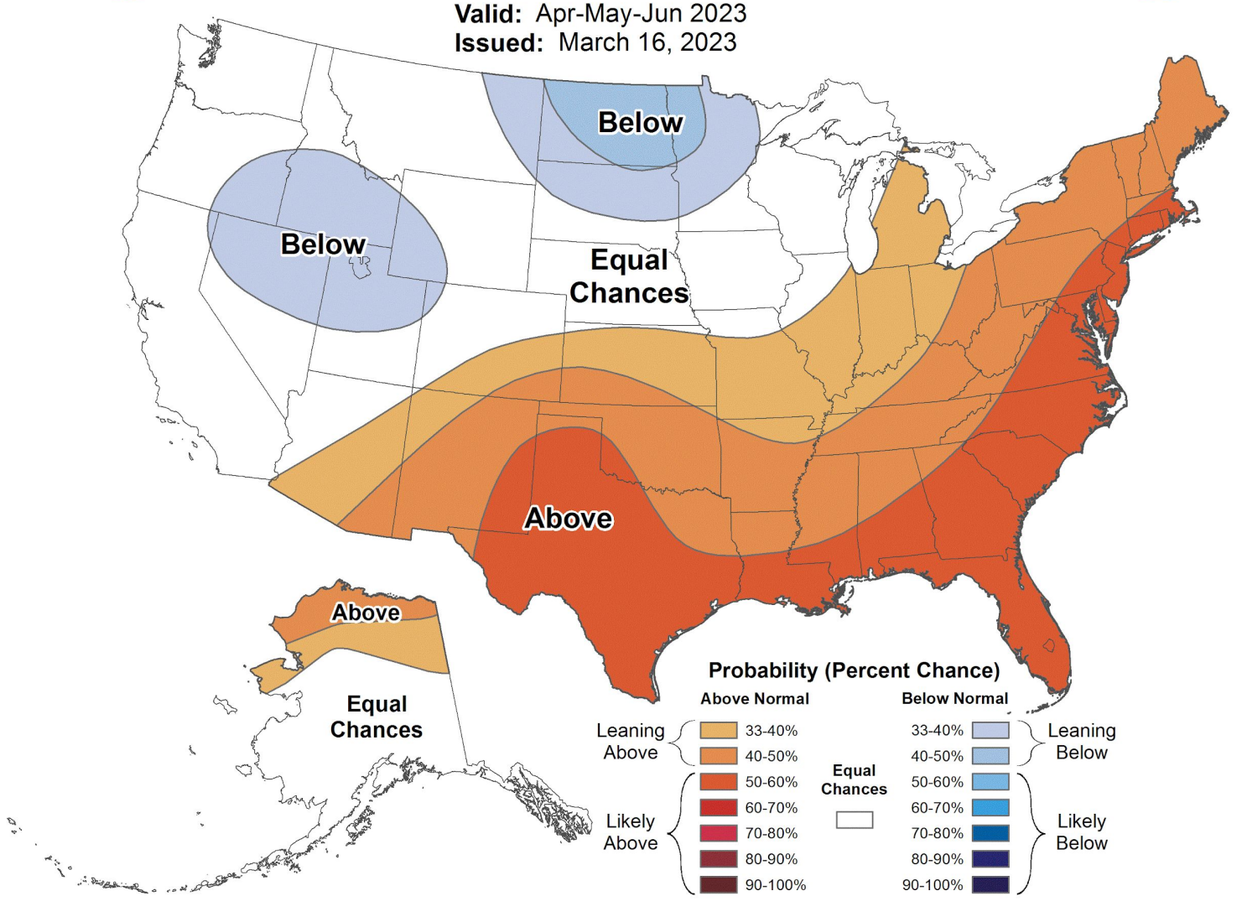


Spring 2023 Flood Outlook for Iowa

Seasonal temperature and precipitation outlooks

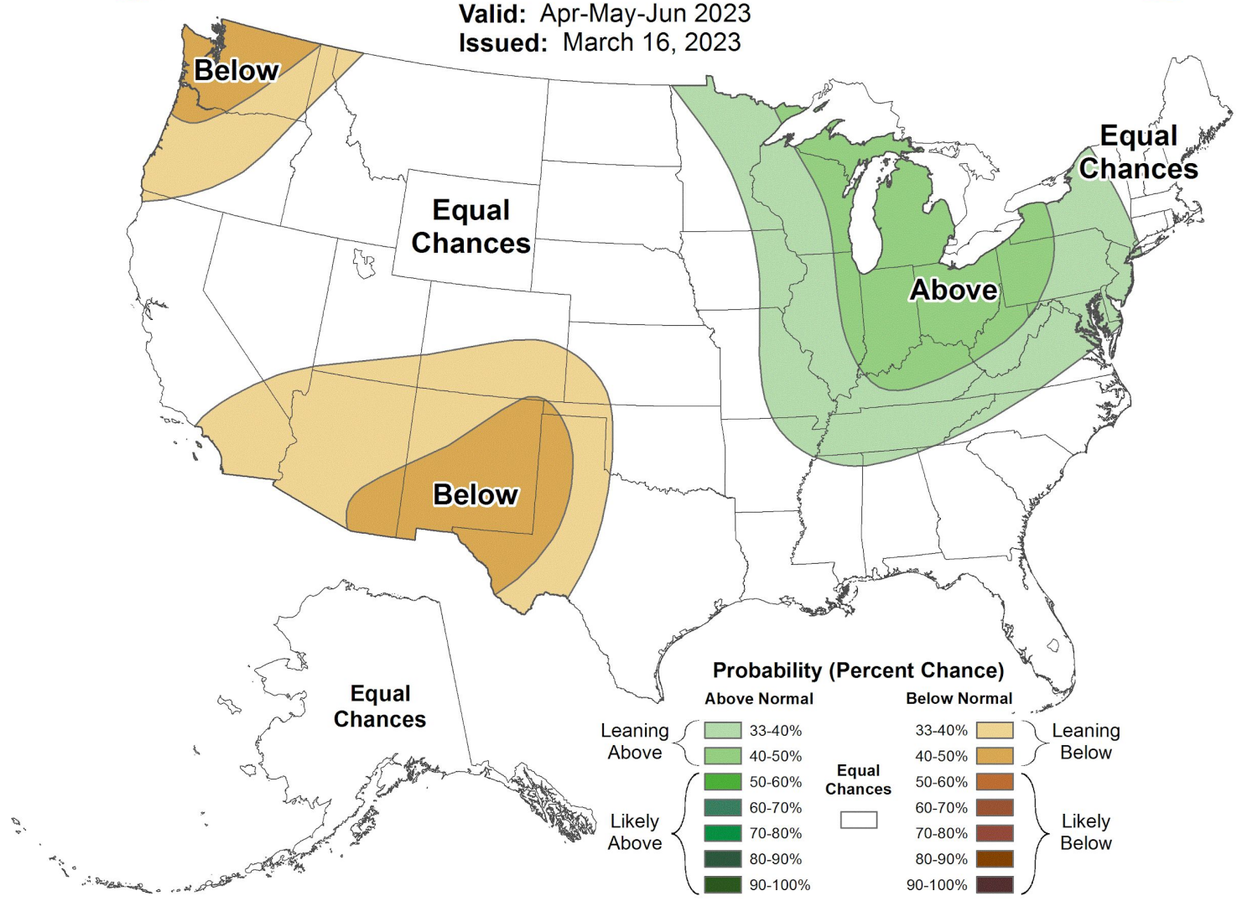
Seasonal Temperature Outlook

Valid: Apr-May-Jun 2023
Issued: March 16, 2023



Seasonal Precipitation Outlook

Valid: Apr-May-Jun 2023
Issued: March 16, 2023



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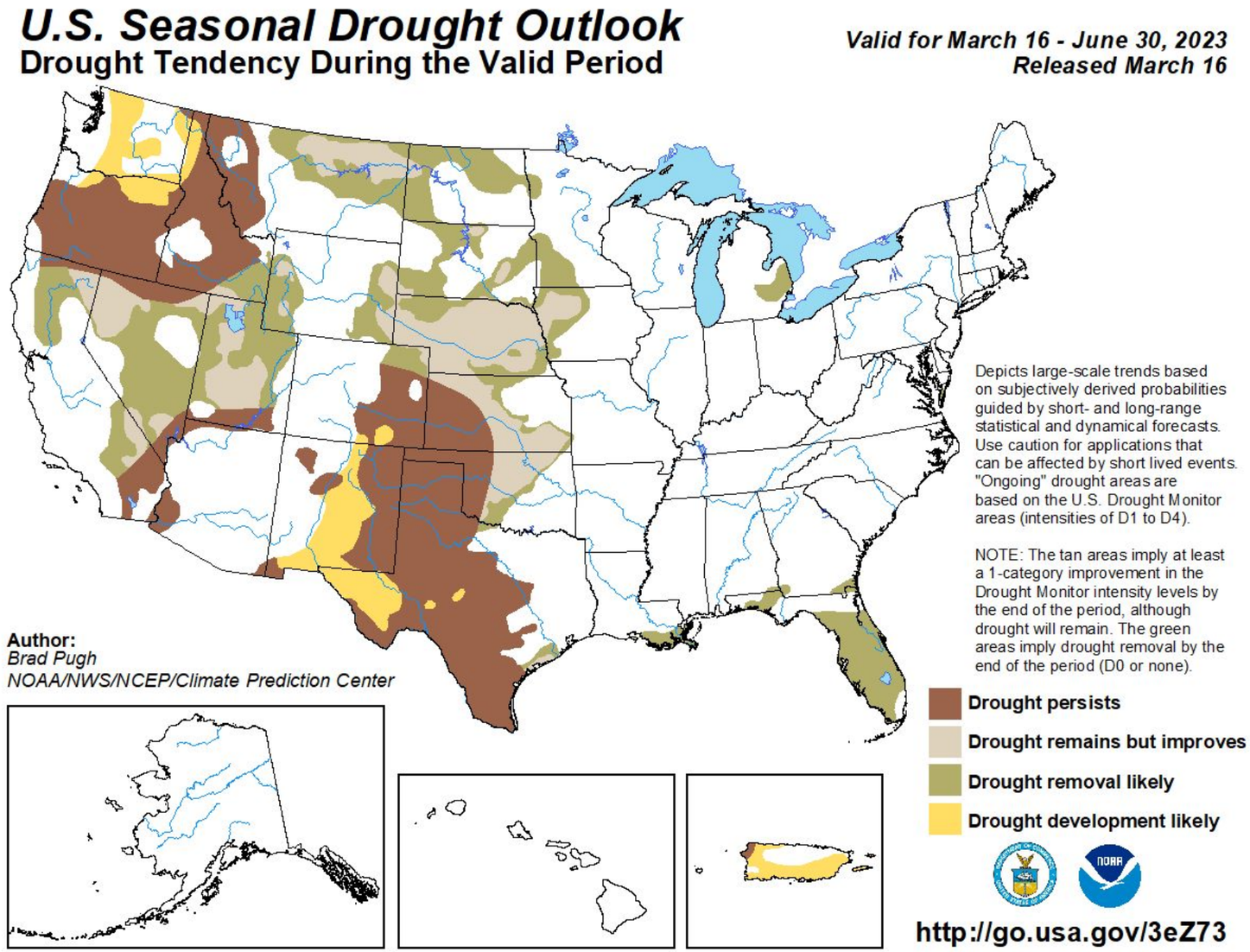
Iowa

Spring 2023 Flood Outlook for Iowa

Seasonal drought outlook



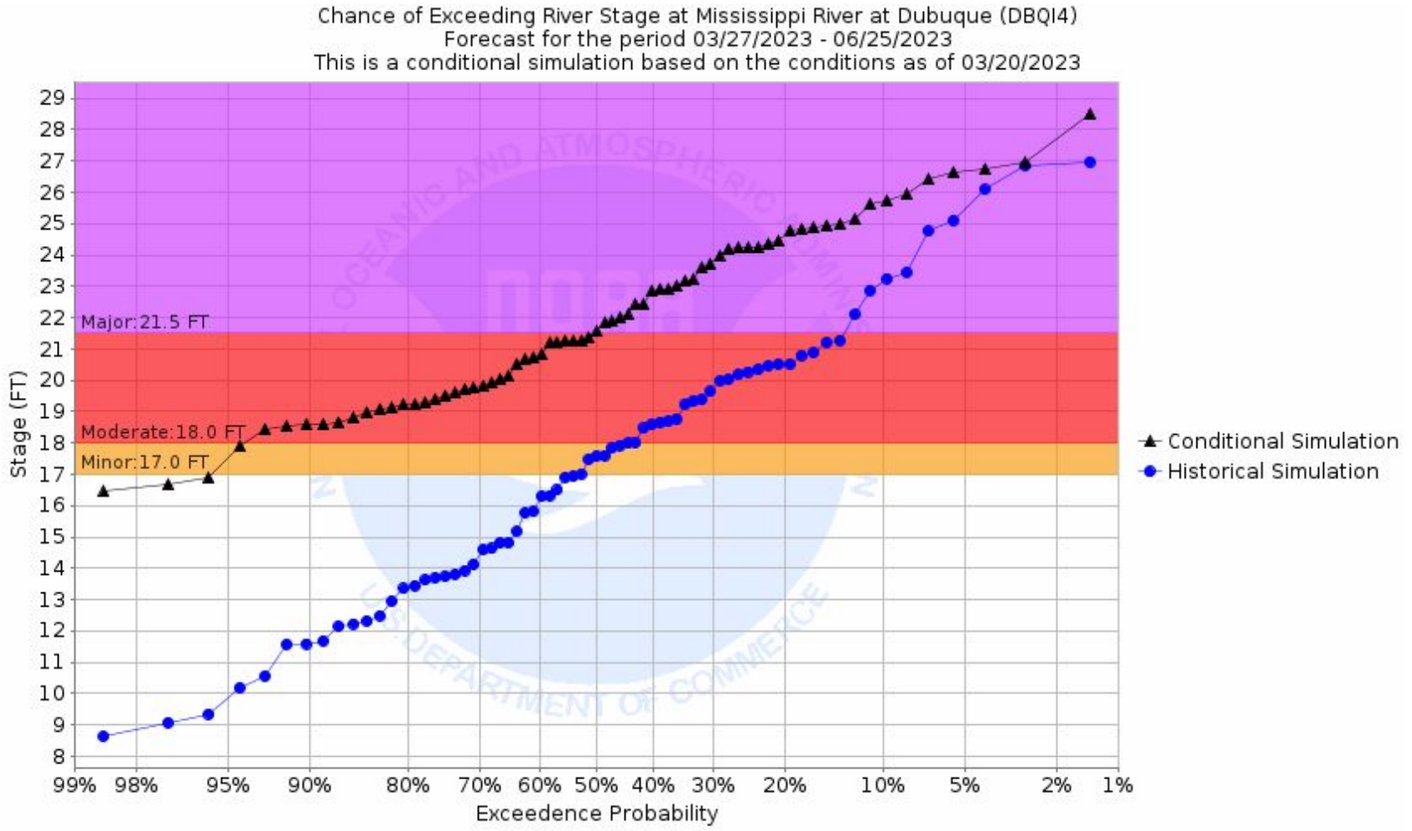
Drought conditions expected to improve across Iowa

Spring 2023 Flood Outlook for Iowa

Long-range probabilistic information–90-day period

Long-Range Flood Risk (90-day period)

- Available on AHPS > Long-Range Flood Risk > Chance of Exceeding Levels during Entire Period.
- The graph to the right represents the exceedance probabilities during the 90-day period.
- Blue line is considered the normal chance (i.e., climatology)–the historical simulation.
- Black line is based on current conditions (e.g., river levels, snowpack, etc.)–the conditional simulation.
- When the black line is left of the blue line, chances for higher river levels and flooding are higher than normal.
- Conversely, when the black line is to the right of the blue line, chances for higher river levels and flooding are lower than normal.
- A high likelihood of flooding does not necessarily mean an above normal risk.



Example–Mississippi River at Dubuque

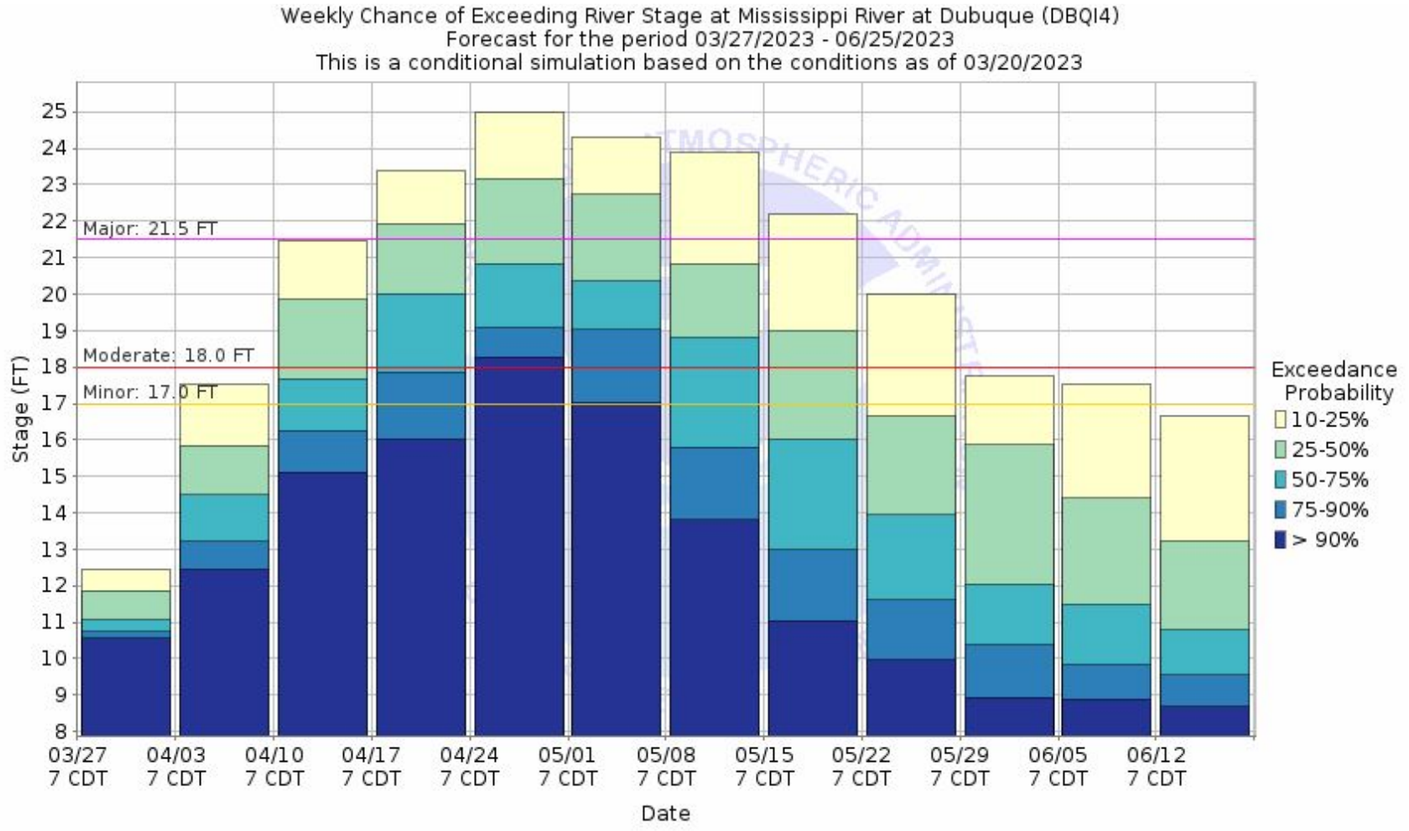
- Black line is left of the blue line (higher than normal chances).
- >95% chance of exceeding minor flood stage (normal is 53%).
- 50% chance of exceeding major flood stage (normal is 14%).

Spring 2023 Flood Outlook for Iowa

Long-range probabilistic information–weekly chances during 90-day period

Long-Range Flood Risk (weekly chances during 90-day period)

- Available on AHPS > Long-Range Flood Risk > Weekly Chance of Exceeding Levels.
- The graph to the right represents the exceedance probabilities each week during the 90-day period.
- Yellow color of the bar graph represents the 10-25% exceedance probability. Essentially, there is a 10-25% chance that the river will reach that particular level during that particular week.
- The exceedance probabilities increase as colors become more blue–25-50% (light green), 50-75% (teal), 75-90% (light blue) and >90% (dark blue).

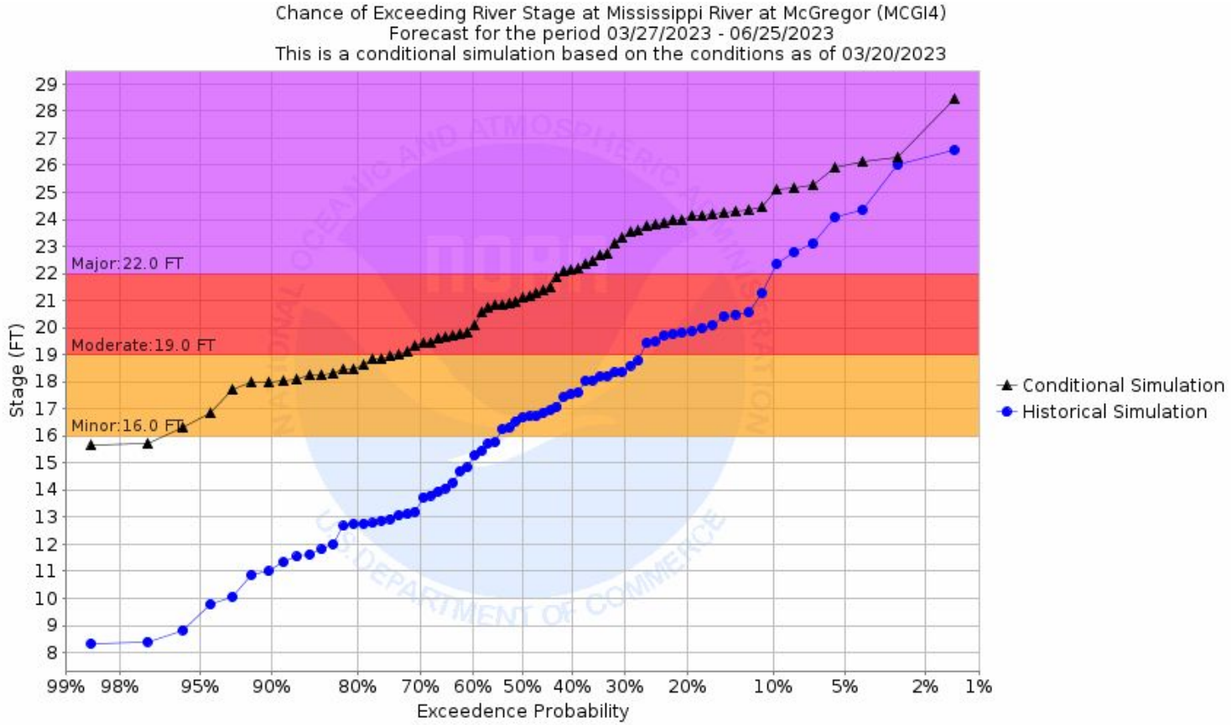


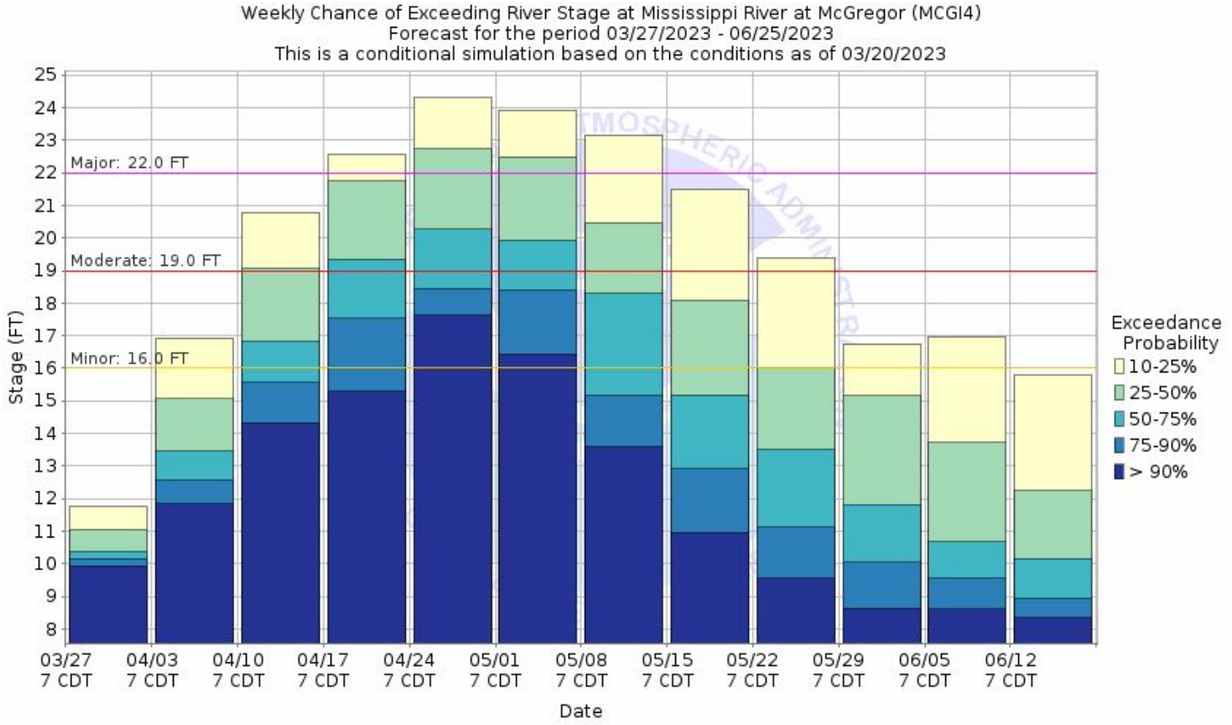
Example–Mississippi River at Dubuque

- Higher chances of flooding begin in mid April, with the best chance of reaching minor flood stage in late April to early May.

Spring 2023 Flood Outlook for Iowa

Probabilistic Forecast Data for Mississippi River at McGregor





Mississippi River at McGregor

- Black line is left of the blue line (higher than normal chances).
- >95% chance of exceeding minor flood stage.
- 42% chance of exceeding major flood stage.

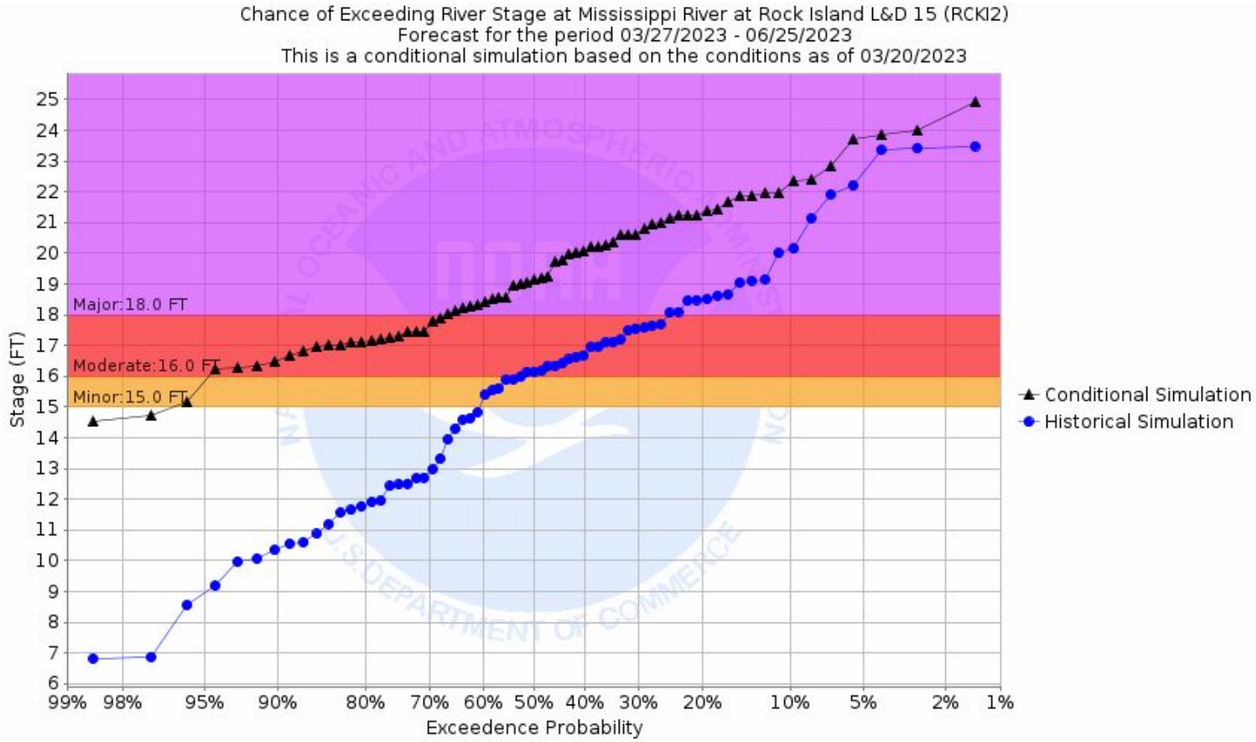
Mississippi River at McGregor

- Greatest probability of exceeding flood stage is during the week of April 24th into the first week of May.

More graphics available on AHPS

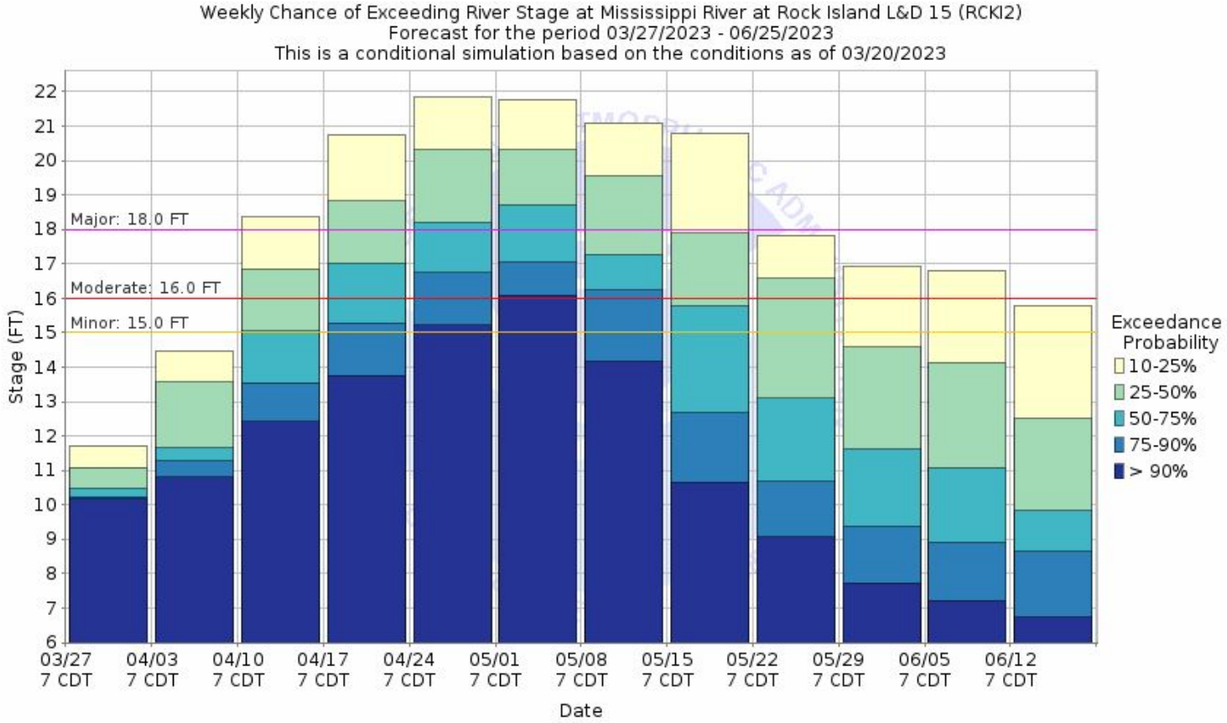
Spring 2023 Flood Outlook for Iowa

Probabilistic Forecast Data for Mississippi River at Rock Island



Mississippi River at Rock Island

- Black line is left of the blue line (higher than normal chances).
- >95% chance of exceeding moderate flood stage.
- 67% chance of exceeding major flood stage.



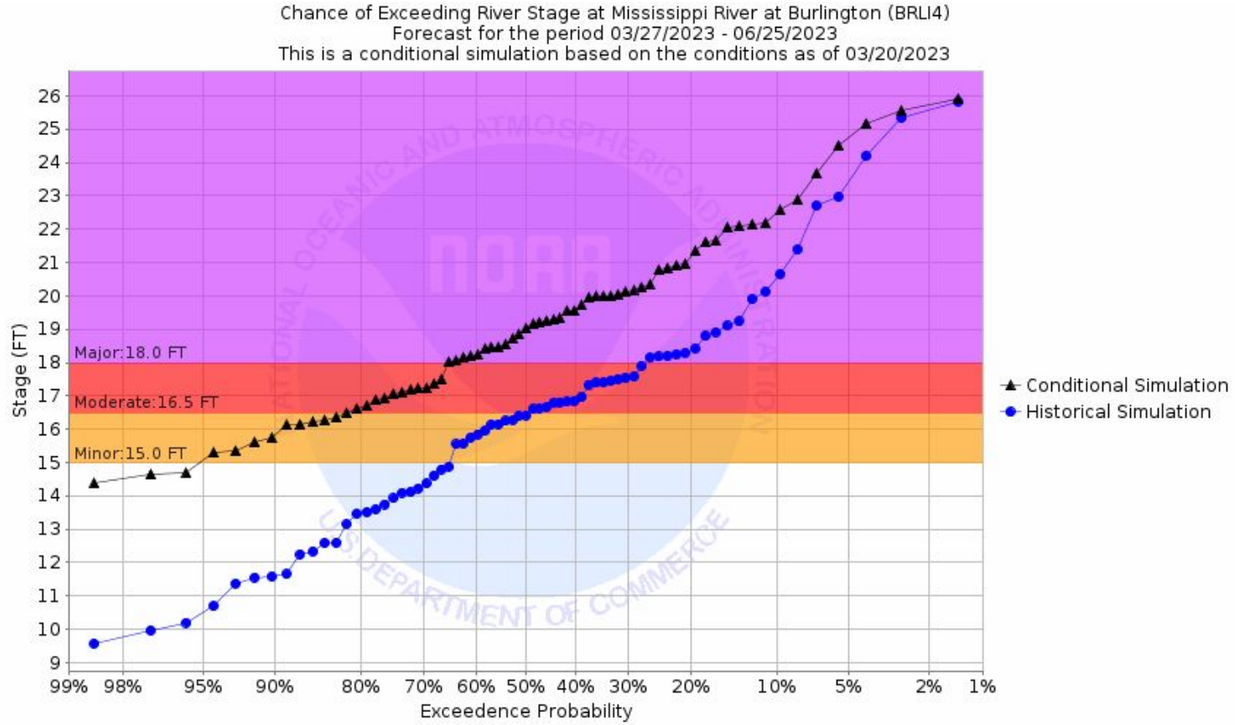
Mississippi River at Rock Island

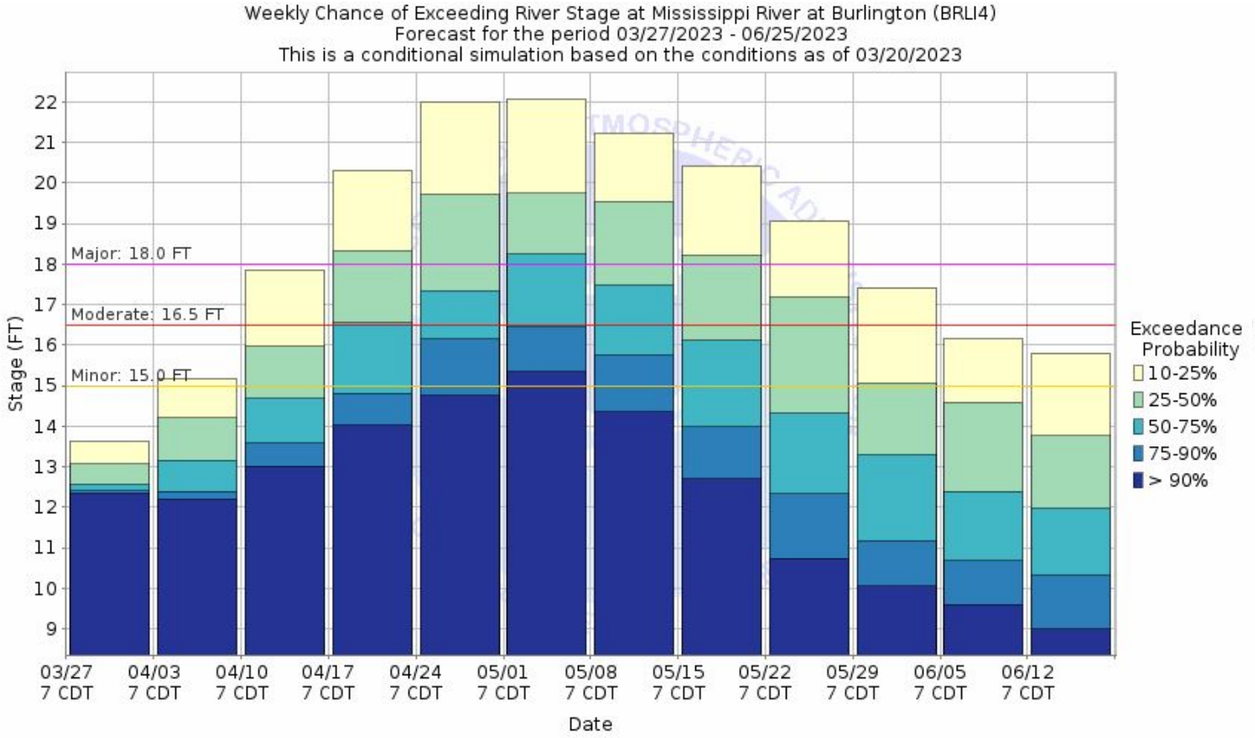
- Greatest probability of exceeding flood stage is during the week of May 1st through the first week of May.

More graphics available on AHPS

Spring 2023 Flood Outlook for Iowa

Probabilistic Forecast Data for Mississippi River at Burlington





Mississippi River at Burlington

- Black line is left of the blue line (higher than normal chances).
- >95% chance of exceeding minor flood stage.
- 65% chance of exceeding major flood stage.

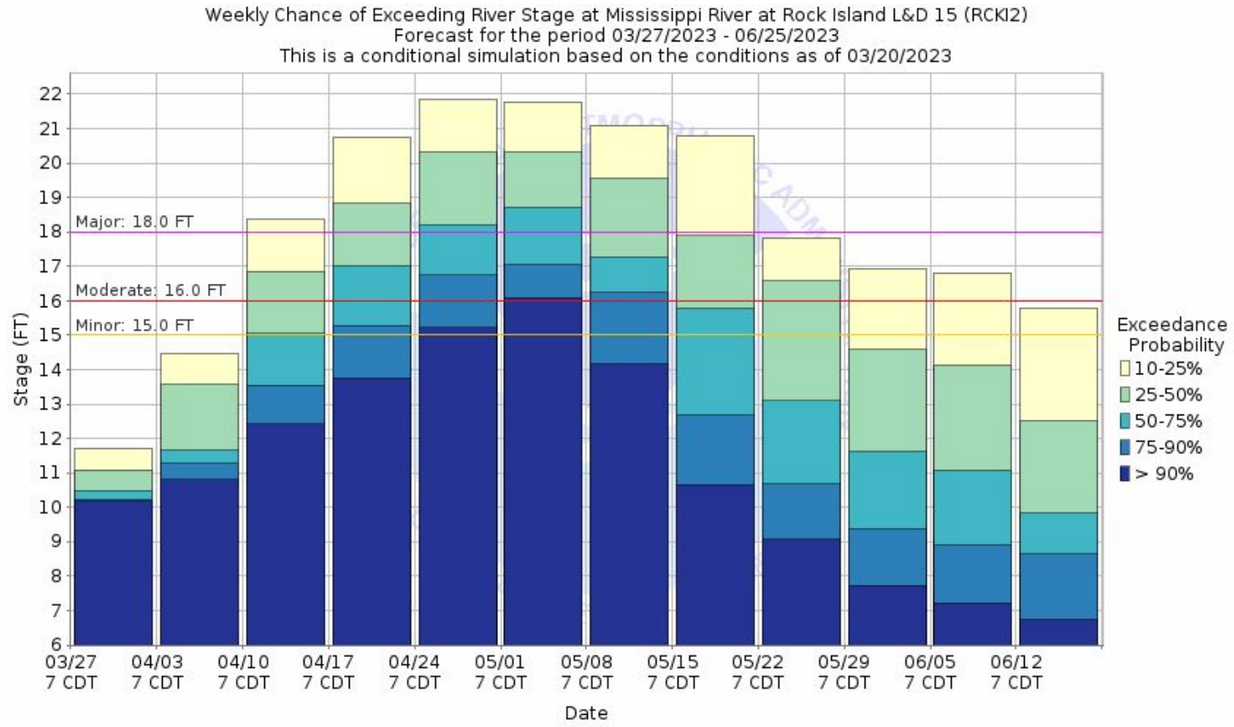
Mississippi River at Burlington

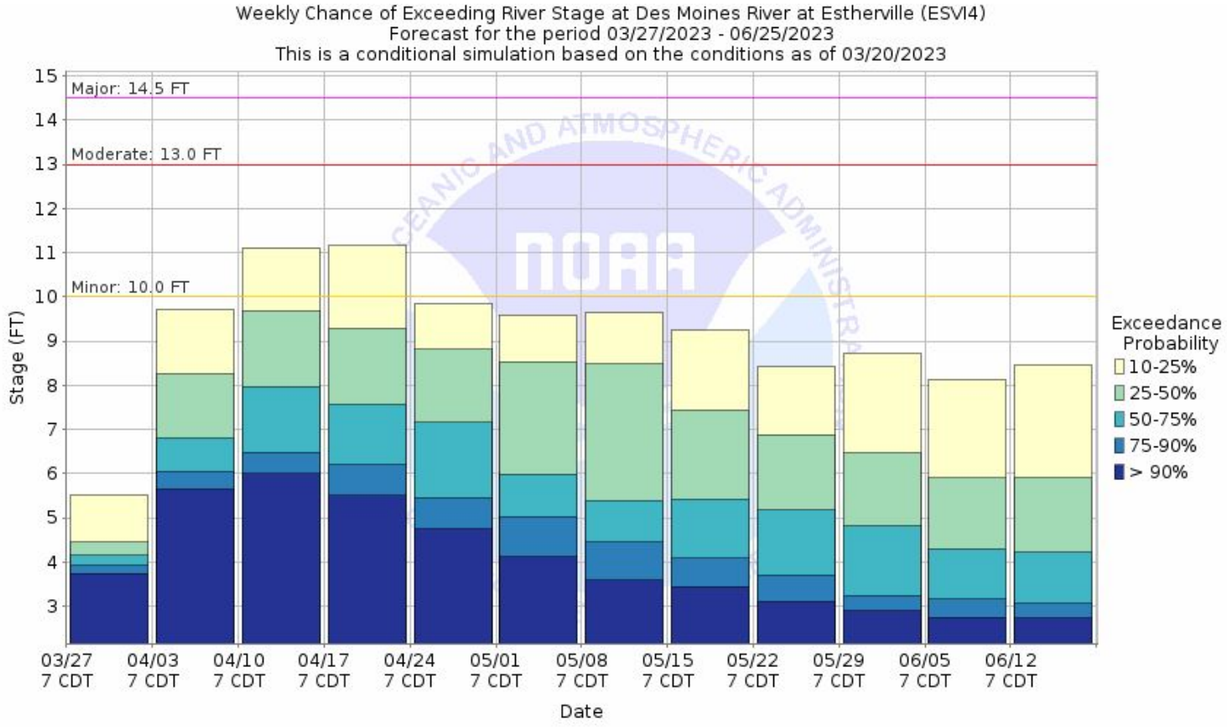
- Greatest probability of exceeding flood stage is during the week of May 1st through the first week of May.

More graphics available on AHPS

Spring 2023 Flood Outlook for Iowa

More examples–long-range probabilistic info–weekly chances during 90-day period





Mississippi River at Quad Cities L&D 15

- Higher chances of flooding begin in early April, with the best chance of reaching minor flood stage in mid to late April.

West Fork Des Moines River at Estherville

- Higher chances of flooding begin in early April, with the best chance of reaching minor flood stage in mid April.

More graphics available on AHPS

Spring 2023 Flood Outlook for Iowa

What could increase the chances or decrease the chances for significant flooding?

Future weather–especially the weather conditions leading up to, during and immediately after the snowmelt period–is the biggest factor for significant spring flooding.

Factors leading to increased chances

- Slower than normal warm-up leading up to the snowmelt period–keeps the snowpack longer
- Fast warm-up during the snowmelt period–leads to rapid snowmelt
- Above normal precipitation leading up to the snowmelt period–adds more water to the system
- Moderate to heavy precipitation (rainfall) during the snowmelt period–including rain on snow–adds more water to the system
- Above normal precipitation immediately after the snowmelt period–prolongs the higher river stages and may result in secondary crests

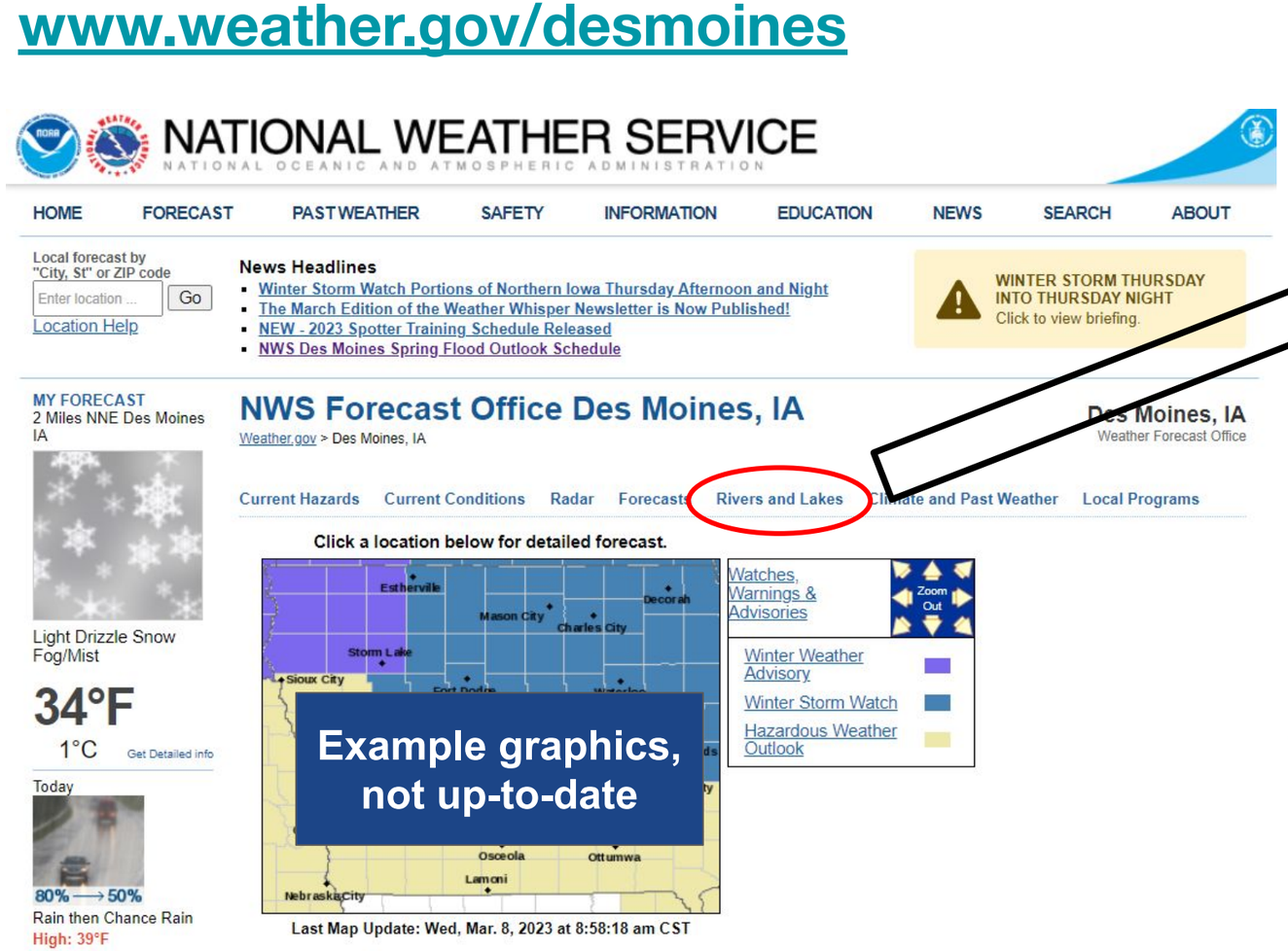
Factors leading to decreased chances

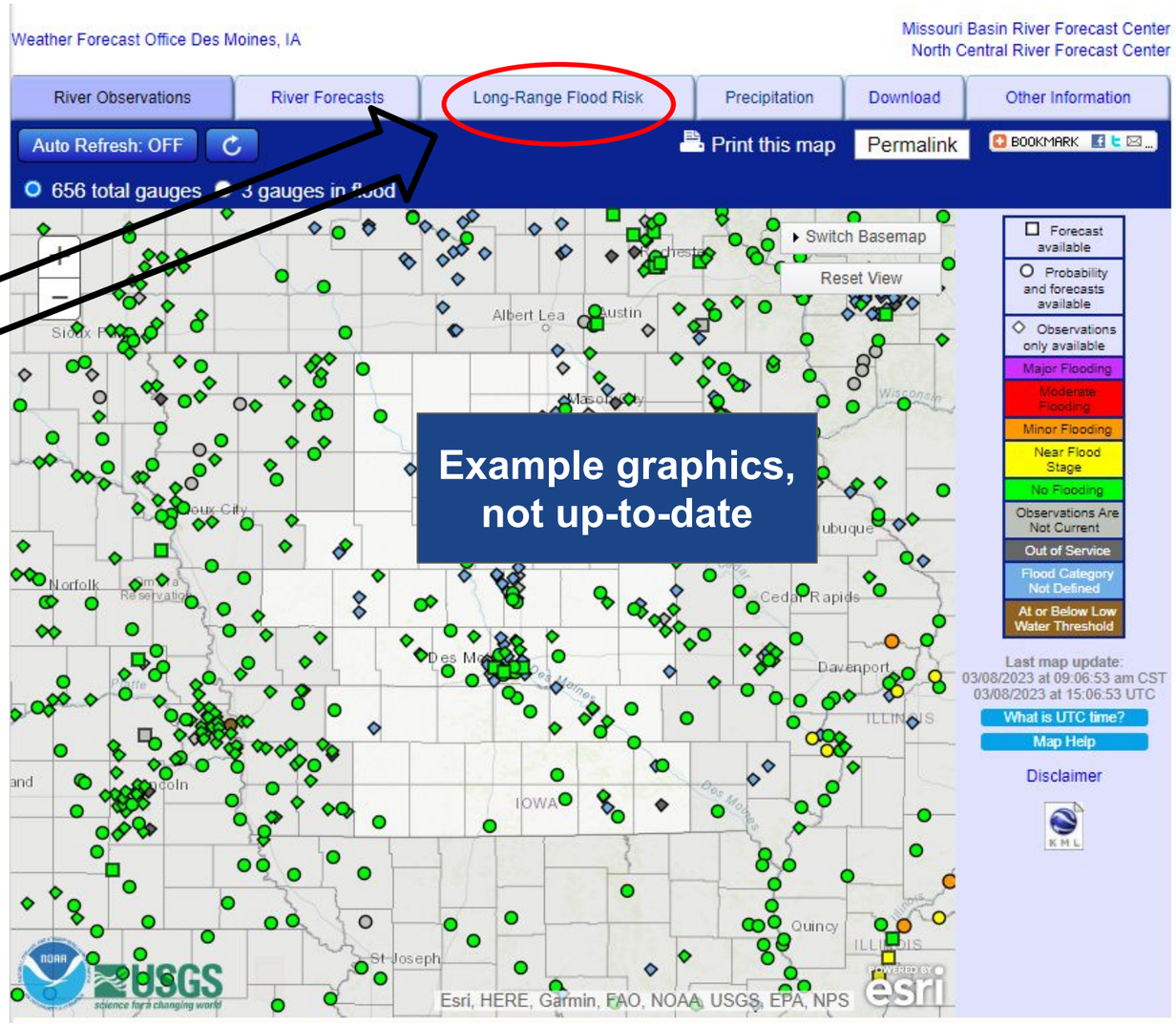
- Normal warm-up leading up to the snowmelt period
- Slow and steady snowmelt–introduces water to the system more slowly
- Little to no additional precipitation during the snowmelt period–adds little if any additional water to the system
- Normal to below normal precipitation immediately after the snowmelt period–allows the river levels to fall back to normal levels

Spring 2023 Flood Outlook for Iowa

How to access probabilistic information on our Website

www.weather.gov/desmoines





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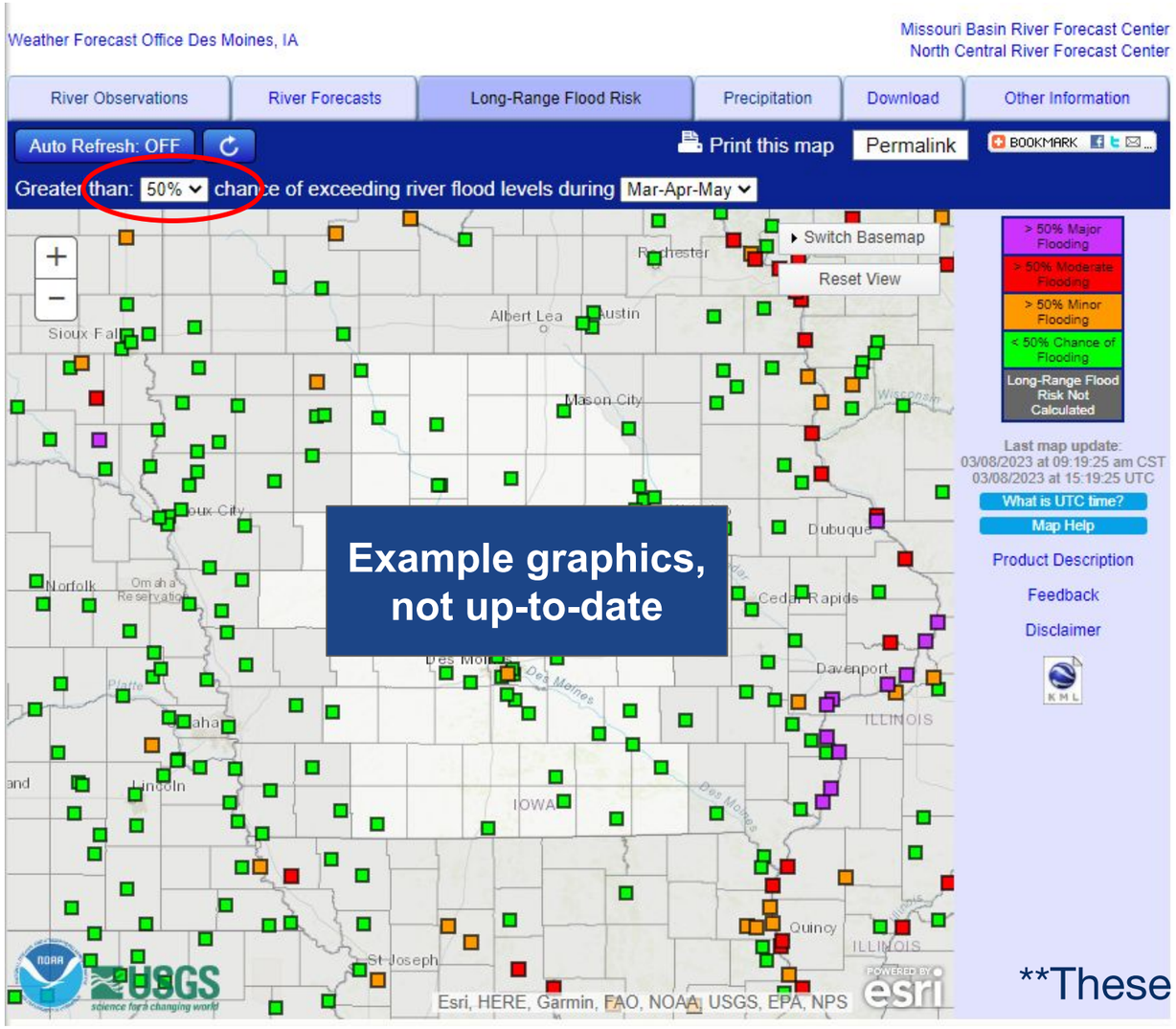

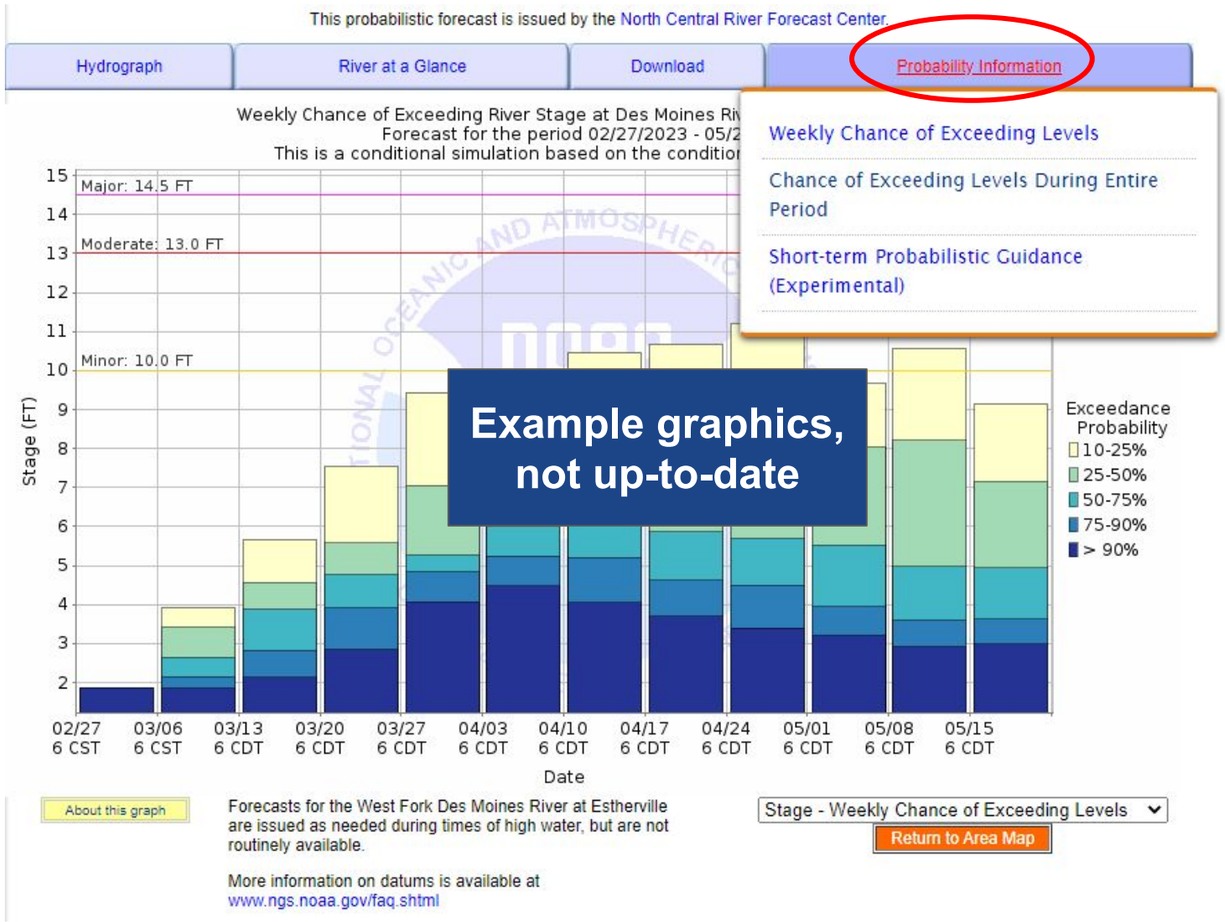

These graphics normally updated near the end of each month

Spring 2023 Flood Outlook for Iowa

Flood risk by river, 3/23/2023

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Missouri River–down to Platte River	Near to below normal
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Tributaries to Mississippi River in Central Iowa	Near to below normal
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Tributaries to Missouri River in Iowa	Near to below normal

Spring 2023 Flood Outlook for Iowa

Spring flood element checklist, 3/23/2023

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For your reference, here are links to the current Drought Monitor as well as the NWS/CPC Seasonal Drought Outlook.

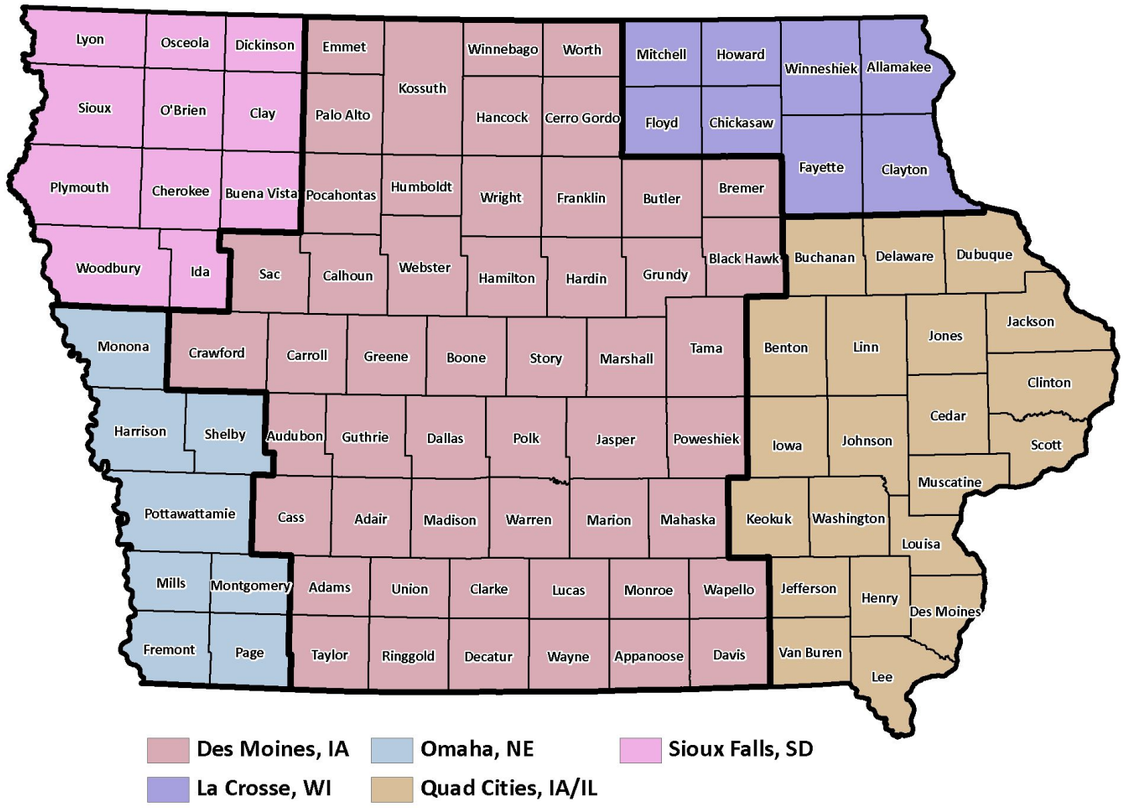
Spring 2023 Flood Outlook for Iowa

Where to find more details

Each NWS office serving Iowa provides its own spring flood outlook information for its own service area. Below are the websites for the NWS offices serving Iowa.

- NWS Des Moines: weather.gov/desmoines
- NWS Quad Cities, IA/IL: weather.gov/quadcities
- NWS Sioux Falls, SD: weather.gov/siouxfalls
- NWS Omaha, NE: weather.gov/omaha
- NWS La Crosse, WI: weather.gov/lacrosse

NWS office service areas



For the latest river stage and forecast information, along with quantitative river flood outlook information, refer to the NWS Advanced Hydrologic Prediction Service (AHPS) Website.